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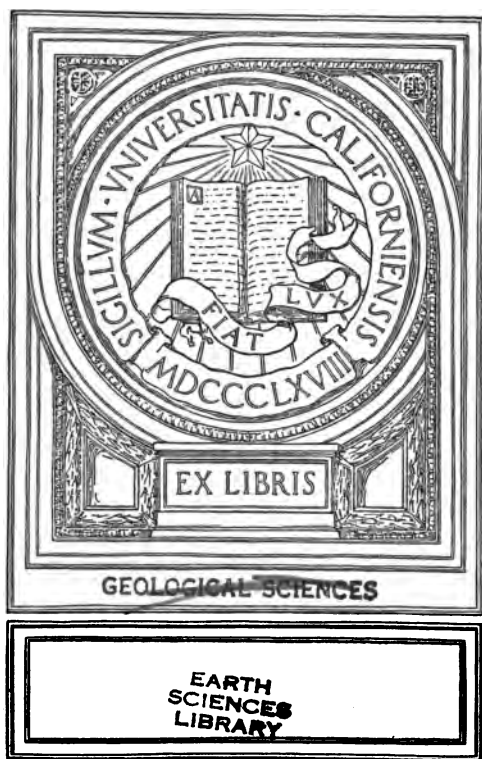
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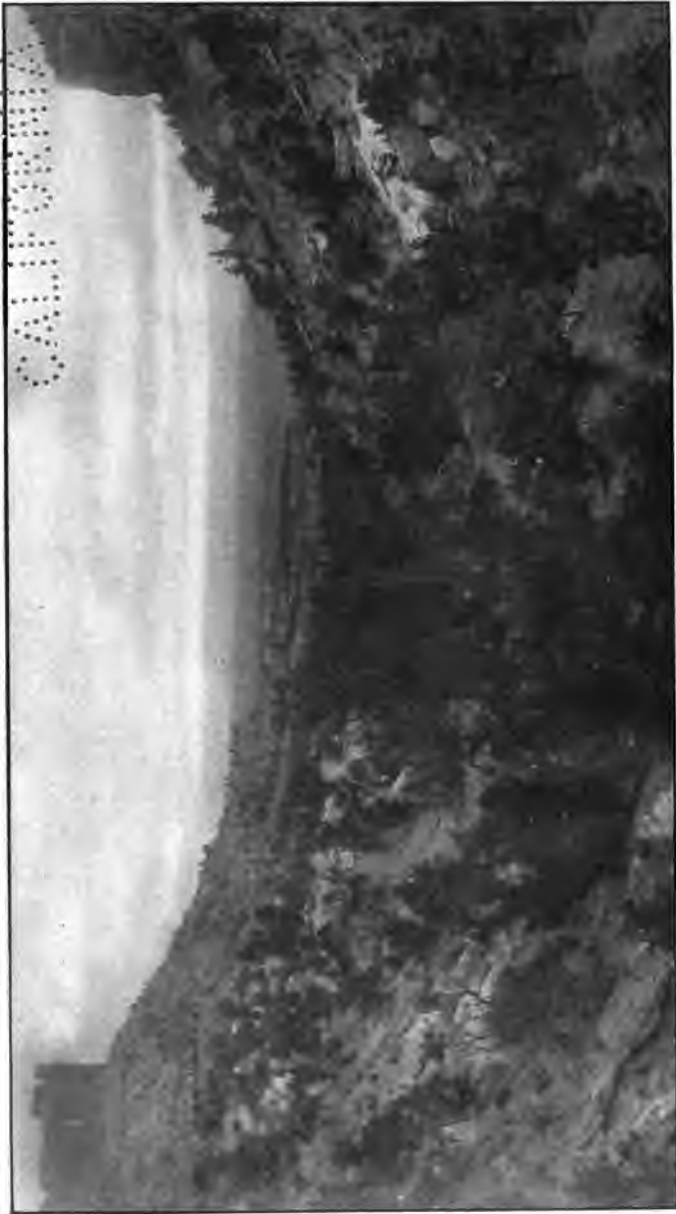
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UNIVERSITY OF CALIFORNIA



"San Anton Pass," Continental Divide, Looking Northwest.

Report Number I

Early editions

THE NATURAL RESOURCES SURVEY

of

The Conservation and Natural
Resources Commission

of

New Mexico (1911)

1911

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NEW MEXICAN PRINTING COMPANY
1911

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LETTER OF TRANSMITTAL

Albuquerque, New Mexico, Dec. 1st, 1911.

To His Excellency Wm. J. Mills, Governor of the Territory of New Mexico.

HONORABLE SIR:

It becomes my duty by virtue of the statute to hereby transmit to you the report of Natural Resources Survey of New Mexico for the year 1911.

Respectfully,
J. A. PYNCH,
Director.

M120630

THE COMMISSION

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PREFACE

In this publication it is not intended to do more than give in a general way, some facts about the subjects treated. There has been no intention or expectation to exhaust the subject matter or to be scientific only as the scientific may help to explain common facts and phenomena. Since a scientific treatise in this stage in the development of the state would in many ways be superfluous it has seemed wiser to correlate some of the common things concerning this section of the state and collect them in such a way as to make them available for the interested. Since the work of Survey was not begun until the latter part of July of this year, the work accomplished is necessarily meager in amount. However since the sum of money available for each division was also small, it is hoped that the amount expended and the work accomplished will correlate satisfactorily.

As the state of New Mexico perfects her secondary school system, courses in phsiography and nature study, will be added to the curriculum. At that time—which will be very soon—the New Mexican student will be required to know, among other things, the style of architecture nature has used in the building of his state. He will be asked questions in nature study concerning the “bird, the bee and the ant” of his locality, and the great host of our friends which inhabit the air and the earth, and which live under so many varied conditions, will crowd into his mind for recognition. The growth of scientific agriculture makes a grounding in Botany a fundamental prerequisite for training along such lines. We already have an up-to-date agricultural school in the new state and the Biology of the state will be considered an absolute essential of an agricultural course when the knowledge of this subject grows more complete was research fills in the gaps. New Mexico will then be growing and expanding into the new position and mission to which the times and her natural development have called her. The people within and without the state are asking even now, and will continue

to ask, about New Mexico's natural heritage. These reports are answers in part to such queries.

New Mexico has vast resources. As the outside world becomes cognizant of this fact, immigration will be rapid. It is safe to assert that this state will experience a phenomenal development within the next decade and will be known as one of the richest states of the great south west.

Thanks are due to the Commission for the helpful and co-operative spirit shown by these gentlemen. Likewise appreciation is expressed to the chiefs of the different divisions for the interest they have shown in the work and their determination to accomplish a considerable in a very limited time. Thanks are also due to Professor J. R. Watson, Zoologist accompanying the Director on his reconnaissance, whose ready assistance and valuable knowledge of his section of the work has added great interest and value to the report.

J. A. PYNCH,

Director,

University of New Mexico,
Albuquerque, N. M.

GENERAL REPORT

Division of Botany and Agricultural Resources, New Mexico Resources Survey.

H. S. Hammond, Chief. Agricultural College, N. M.

The work of this Division of Survey has been confined mostly to a study of New Mexican birds and more detailed account of which is given below.

During the past five months, we have started a herbarium for the Survey and at present, over 200 specimens have been sent to the University, all correctly labeled and carefully mounted and upwards of 500 more are in process of preparation and will probably be deposited in the Survey Museum before the close of the year. Duplicates of all material collected and all material sent to the Survey Museum are deposited in the Herbarium of the Agricultural College at Mesilla Park.

The bird work referred to above, has been undertaken on rather an extensive scale. It is the desire of the Division of Botany and Agricultural Resources to secure accurate information concerning the birds of New Mexico, their habits, migrations, economic importance, etc., and with that end in view, we have established at five different localities in the state, stations where data will be kept and specimens secured for the Survey. These stations are located as follows: Deming, N. M., in charge of Marshal Foulks; Albuquerque, N. M., in charge of Prof. A. O. Weese; Raton, N. M., in charge of James Campbell; Naravisa, N. M., in charge of A. S. Felton; Cloudcroft, N. M., in charge of H. H. Lucas, and the local station at Mesilla Park. Negotiations are now underway for the establishment of two more stations; one at Farmington in San Juan county, and the other at either Roswell in Chaves county or Artesia in Eddy county. At each of these stations, the person in charge will endeavor to keep a list of all the birds of that locality and times and dates of migrations, whether permanent residence or not, the abundance of such species, and in fact every item that may

be of interest to the scientist concerning the species in question. Specimens will also be taken if possible of the migratory species and of the rarer residents and the skins stuffed but not mounted. In this matter, we hope to secure a correct list of all the species within the State and arrange same in such a form that it may be used as a nature study work and text for the secondary schools.

While this work will take possibly two or three years to complete, we feel that it is one that will not be duplicated for several years. Miss Ford, who is undertaking the work, has had considerable experience along this line, and done extensive studying, and we feel that the realization of this work will meet all expectations.

Below is given a preliminary list of the birds of New Mexico, compiled from Miss Ford's notes which we wish to incorporate in our report at this time. As this is the largest list of New Mexico birds that has ever appeared in print, we do not offer this list as check list, and some that are reported may have to be dropped from our later list, and probably many not reported will have to be added to the list and up to the present time, it is the most accurate and complete list of any heretofore published. This list includes the names of all species which are known to occur in the State, together with accurate citations of those who reported them and often notes are found concerning relative points of each. The rest is arranged according to the A. O. U. check list. These notes will be of great value to ornithologists throughout this country.

PRELIMINARY LIST OF BIRDS OF NEW MEXICO

COMPILED BY F. FORD.

1. *Aechmophorus occidentalis*. Western Grebe.
"One specimen, Gila, Nov." (Henshaw.)
2. *Colymbus nigricollis californicus*. Eared Grebe.
"Rare, breeding at 7000 ft., vicinity of Las Vegas," (Mitchell.)—One specimen, Bernalillo, Oct. 28. (Birtwell.)
3. *Podilymbus podiceps*. Pied-billed Grebe.
One specimen, Albuquerque, Oct. 14. (Birtwell.)
4. *Gavia pacifica*. Pacific Loon.
"Accidental in New Mexico." (A. O. U. Check List.)
5. *Larus delawarensis*. Ring-billed Gull.
One specimen, Albuquerque, April 20. (Birtwell.)—One specimen, Thirteen Mile Lake, Chaves Co., Oct., (Barber.)—One specimen, Mangus Springs, May. (Metcalf.)
6. *Xema Sabini*. Sabine's Gull.
One specimen, Albuquerque, Oct. 8. (Birtwell.)
7. *Sterna hirundo*. Common Tern.
"Common on Rio Grande." (Henshaw.)
8. *Hydrochelidon nigra surinamensis*. Black Tern.
"Several seen near Las Vegas, Aug. 31." (Bailey, F.)
9. *Anhinga anhinga*. Water-Turkey.
"Accidental in New Mexico." (A. O. U. Check List.)
10. *Phalacrocorax vigua mexicanus*. Mexican Cormorant.
"New Mexico." (A. O. U. Check List.)
11. *Mergus americanus*. Merganser.
"One female and four young seen, Upper Pecos, July 2." (Goss.)—One specimen, Tortugas Lake, Nov. (Ford.)
12. *Lophodytes cucullatus*. Hooded Merganser.
"Northern New Mexico." (A. O. U. Check List.)
13. *Anas platyrhynchos*. Mallard.
"Bagged in profusion, Albuquerque, Sept. 23". Other specimens Sept. 10 and 17, Oct. 7 and Nov. 18. (Birtwell.)—"Common in New Mexico." (Woodhouse.) Always among the migrants in spring and fall in Mesilla Valley. (Ford.)
14. *Mareca americana*. Baldpate.
"One specimen, Silver City, Apr. 15". (Hunn.)—"Quite abundant in New Mexico." (Woodhouse.)—One specimen, Albuquerque, Oct. (Stover.)

15. *Nettion carolinense*. Green-winged Teal.
Common in spring and fall, Mesilla Valley. (Ford.)—
"Specimen, Apache, Sept.; Hachita, Oct. (Anthony.)—
"Mts. east of Santa Fe." (Henshaw.)—"Common
around Las Vegas Hot Springs in Dec." (Batchelder.)
—"Very abundant in New Mexico." (Henshaw.)—
"Rather common, especially during migration, and
breeds in vicinity of Las Vegas." (Mitchell.)—"Com-
mon during winter and spring, Silver City." (Hunn)—
One specimen, others seen, Albuquerque, September.
(Birtwell.)—One specimen, Roswell, Oct. (Barber.)
16. *Querquedula discors*. Blue-winged Teal.
"Twenty seen Sept. 7, Also a few Sept. 15, seven miles east
of Apache." (Anthony.)—"Breeding at Mesa Rica, June
2, also seen at Santa Rosa and Black Lake." (Bailey F.)
—"Four seen, Willis, May 11, also flocks seen, Albu-
querque, Sept. 6 and 10." (Birtwell.)—"Very abundant
throughout New Mexico." (Woodhouse.) One speci-
men, Roswell, Oct. (Barber.)—Among other ducks in
spring and fall, Mesilla Valley. (Ford.)
17. *Querquedula cyanoptera*. Cinnamon Teal.
"Common spring migrant, Silver City." (Hunn.)—"Flocks
seen near Albuquerque, Apr., May, and Sept." (Birtwell.)
—"Killed three on San Augustine Ranch, Apr." (Wooton.)—"Common migrant, Mangus Springs,"
(Metcalf.)—Common migrant, Mesilla Valley. (Ford.)
18. *Spatula clypeata*. Shoveller.
"Very abundant in New Mexico." (Woodhouse.)—"Bagged
in profusion, Albuquerque, Sept. 23 (Birtwell.)—"New
Mexico." (A. O. U. Check List.)—"Have seen at Man-
gus Springs." (Metcalf.)—One specimen, Albuquerque,
Oct. (Birtwell.)
19. *Dafila acuta*. Pintail.
"One killed Sept. 6, two Sept. 30, Bernalillo. Bagged in
profusion, Albuquerque, Sept. 23. (Birtwell.)—"Com-
mon in New Mexico." (Woodhouse.) "Common in
spring, Mangus Springs." (Metcalf.)—Migrant in Me-
silla Valley. (Ford.)
20. *Marila americana*. Redhead.
"New Mexico." (A. O. U. Check List.)
21. *Marila valisineria*. Canvas-back.
"Occurs at Mangus Springs but not abundantly." (Met-
calf.)—One specimen, Albuquerque, Jan. (Birtwell.)—
Spring and summer, Mesilla Valley. (Ford.)
22. *Marila marila*. Scaup Duck.
"Southern New Mexico." (A. O. U. Check List.)

23. *Marila collaris*. Ring-necked Duck.
 "New Mexico." (A. O. U. Check List.)
24. *Charitonetta albeola*. Buffle head.
 "Obtained in various parts of New Mexico." (Henshaw.)
25. *Erismatura jamaicensis*. Ruddy Duck.
 "One specimen, old crater, south of Zuñi." (Henshaw.)—
 "One specimen, Sept. 7 and also on Sept. 16 and in
 Oct. at Albuquerque." (Birtwell.)—"Occasional large
 droves on Gila." (Metcalfe.)—One specimen, Mesilla
 Park, Feb. (Ford.)—"Northern New Mexico." (A. O.
 U. Check List.)
26. *Branta canadensis canadensis*. Canada Goose.
 "Tolerably numerous up the Rio Grande to Santa Fe."
 (Mc. Call.)
27. *Branta canadensis hutchinsi*. Hutchin's Goose.
 "Flock seen, Albuquerque, Oct. 7." (Birtwell.)
28. *Guara rubra*. Scarlet Ibis.
 "Recorded as a straggler to New Mexico." (A. O. U. Check
 List.)
29. *Plegadis guarauna*. White-faced Glossy Ibis.
 "Three specimens, seven miles east of Apache, Sept. 7." (An-
 thony.)—"Not uncommon, especially in southern part of
 the territory, also seen in vicinity of Las Vegas." (Mit-
 chell.)
30. *Botaurus lentiginosus*. Bittern.
 "One specimen near Las Vegas, June 7." (Mitchell.)—"One
 specimen found dead near Albuquerque, Oct. 7 and one
 seen Apr. 14." (Birtwell.)—"Quite common a few years
 ago at Mangus Springs." (Metcalfe.)—One specimen,
 Patterson, Aug. (Barber.)
31. *Ardea herodias herodias*. Great Blue Heron.
 "Two seen Mar. 21 and one killed May 1, Silver City."
 (Hunn.)—"Seen along Pecos, Ribera, (Bailey F.)—
 "Specimens Mar., one Aug. 16 and one seen Oct. 17, Al-
 buquerque." (Birtwell.)—"Common on Gila River. Nests
 in cottonwoods" (Metcalfe.)—One killed, Mesilla Park,
 Mar. Rather common, especially as a migrant. (Ford.)
32. *Egretta candidissima candidissima*. Snowy Egret.
 "One specimen, Playa Valley, Sept. 24." (Anthony.)—"One
 specimen, G. O. S. Ranch on tributary of Gila River,
 Oct. 21. (Beggold.)—"One specimen on Mimbres River,
 twenty miles from Deming, Nov. 5." (Munson.)—One
 specimen, Mesilla Park, Oct. 1910. (Ford.)

33. *Nycticorax nycticorax naevius*. Black-Crowned Night Heron.
 "Several seen on the Colorado Chiquito." (Henshaw.)—"One seen Sept. 5, one specimen Oct. 29, also Apr. 14, Albuquerque." (Birtwell.)—One killed of a pair May 28, one specimen, Mar., Mesilla Park. (Ford.)
34. *Grus canadensis*. Little Brown Crane.
 "One specimen, Albuquerque, Oct." (Allen.)—"Thousands seen along the Rio Grande." (Henshaw.)—Along the Rio Grande from El Paso to Santa Fe, more common below Albuquerque." (McCall.)—"Observed frequently in New Mexico." (Woodhouse.)
35. *Grus mexicana*. Sandhill Crane.
 "Five seen near Albuquerque, Oct. 7." (Birtwell.)
36. *Fulica Americana*. Coot.
 "Ten seen, Apache, Sept. 13." (Anthony.)—"One found dead near Albuquerque, Oct. 7." (Birtwell.) "One specimen, Roswell, Oct." (Barber.)—"Common a few years ago at Mangus Springs." (Metcalf.) Rather common in Mesilla Valley. (Ford.)
37. *Lobipes lobatus*. Northern Phalarope.
 "One seen near Las Vegas, Aug. 31." (Bailey, F.)
38. *Steganopus tricolor*. Wilson's Phalarope.
 "A flock seen near Las Vegas, Aug. 31." (Bailey, F.)—"One specimen at Albuquerque, April 14, also May 8." (Birtwell.)—One specimen in April, Mesilla Park. (Ford.)
39. *Recurvirostra americana*. Avocet.
 "Twelve seen near Apache, Sept. 7." (Anthony.)—"Summer resident, common, breeds at 8500 ft., vicinity of Las Vegas." (Mitchell.)—"A few in New Mexico." (Woodhouse.)—One specimen, Albuquerque, April 14. (Birtwell.)—"Have been seen in spring at Mangus Springs." (Metcalf.)—One specimen, Mesilla Park, Nov. (Barber.)—"Southern New Mexico." (A. O. U. Check List.)
40. *Himantopus mexicanus*. Black-necked Stilt.
 "Rather common, breeds in vicinity of Las Vegas." (Mitchell.)—One specimen, young, Albuquerque, April 14." (Birtwell.)—"Southern New Mexico." (A. O. U. Check List.)
41. *Gallinago delicata*. Wilson's Snipe.
 "One seen near Hachita for several days in Oct." (Anthony.)—"Common in New Mexico." (Henshaw.)—"New Mexico." (A. O. U. Check List.)—"Almost everywhere from the Gulf to Santa Fe." (McCall.)—"Very common, Mangus Springs." (Metcalf.)—One specimen, Socorro,

- Dec. (Birtwell.)—Reported from the river near Mesilla Park in March. (Ford.)
42. *Pisobia maculata*. Pectoral Sandpiper.
 "A large flock seen near Apache, Sept. 13." (Anthony.)
43. *Pisobia bairdi*. Baird's Sandpiper.
 "Evenly distributed in New Mexico." (Henshaw.)—"Seen Aug. 29 and 30 and one specimen Sept. 2, near Las Vegas." (Bailey, F.)—"Six seen, one killed Sept. 7, more Sept. 10, Albuquerque." (Birtwell.)
44. *Pisobia minutilla*. Least Sandpiper.
 "A large flock seen near Apache, Sept. 13." (Anthony.)—"Seen Aug. 29 to 31 near Las Vegas." (Bailey, F.)
45. *Ereunetes pusillus*. Semipalmated Sandpiper.
 "Seen as migrant." (Henshaw.)—Doubtful. (Ford.)—"One specimen, Albuquerque, Apr. 14." (Birtwell.)
46. *Ereunetes mauri*. Western Sandpiper.
 "Two seen, one specimen, Albuquerque, Oct. 5." (Birtwell.)
47. *Totanus melanoleucus*. Greater Yellow-legs.
 "Two seen, Albuquerque, May 6." (Birtwell.)—One specimen, Patterson, Aug. (Barber.)
48. *Totanus flaviceps*. Yellow legs
 "Several seen near Las Vegas, Aug. 31." (Bailey.)—"One killed near Albuquerque, Oct. 7." (Birtwell.)—"Very common in vicinity of lakes and streams in New Mexico." (Woodhouse.) One specimen, Mesilla Park, Apr. (Ford.)
49. *Helodromas solitarius cinnamomeus*. Western solitary Sandpiper.
 "Several found Aug. 29 to 31 near Las Vegas." (Bailey, F.)
 —Fairly common in vicinity of Las Vegas." (Mitchell.)
50. *Actitis macularia*. Spotted Sandpiper.
 "Found at various points along the Upper Pecos, to 8000 ft." (Henshaw.) "Common, breeds, arrives by May 1, vicinity of Las Vegas." (Mitchell.)—"Two broods in Transition Zone, 8000 ft.; one specimen, Aug. 15, 11,600 ft. Pecos Baldy. One specimen Aug. 24, Pecos 7200 ft." (Bailey.)—"One seen near Albuquerque, Oct. 7. "Two seen Pecos, May 9." (Birtwell.)
51. *Numenius americanus*. Long-billed Curlew.
 "Three pairs seen June 20, breeding also June 22, San Miguel Co." (Bailey.) "Northern New Mexico." (A. O. U. Check List.) One specimen, Patterson, Aug. 14, (Barber)—One specimen, Mesilla, June 20. (Barber.)

52. *Squatarola squatarola*. Black-bellied Plover.
A pair seen late in March, west of Apache." (Anthony.)—
One specimen, Thirteen Mile Lake, Chavez Co., Oct.
(Barber.)
53. *Oxyechus vociferus*. Killdeer.
"One seen Sept. 4 and a large flock, Sept. 7, east of Apache
range." (Anthony) "Throughout North America." (Hens-
shaw.)—"Abundant in various parts of New Mexico."
(Woodhouse)—"Common in vicinity of Las Vegas in
May, to 8000 ft." (Mitchell)—"Common, arriving Mar.
20, Silver City." (Hunn.)—"Seven or eight seen, Pe-
cos, Mar. 27. Several seen, some specimens taken Apr.,
May, Sept., Oct." (Birtwell.)—"Common summer resid-
ent at Mangus Springs." (Metcalf.) Common sum-
mer resident in Mesilla Valley. (Ford.)
54. *Podasocys montanus*. Mountain Plover.
"Not common, breeds in eastern part of County, San Mi-
guel." (Mitchell.) "Northern New Mexico." (A. O. U.
Check List.)—"Datil Mts., March." (Herrick.)
55. *Colinus virginianus texanus* Texas Bob-white.
"Southeastern New Mexico." (A. O. U. Check List.)—
56. *Callipepla squamata squarmata* Scaled Quail.
"Quite common on foothills of Apache and Hachita ranges.
Nest of Eggs found July 13," (Anthony.)—"Abundant
in summer around Fort Bayard." (Wilson.) "Not un-
common at Point of Rocks, Colfax Co., Oct." (Thur-
bur.)—"Between Santa Fe and Albuquerque." (Hens-
shaw)—"Common in large flocks around Silver City."
(Hunn.)—"Plentiful in the pine belt in the southern part
of San Miguel Co." (Bailey F.)—"Large flocks reported
as visiting El Rito." (Henderson.)—"Very abundant the
the year around on the foothills all over Mesilla Valley.
(Ford.) "Very common on foothills of Mogollon Mts."
(Metcalf.)
57. *Lophortyx gambeli*. Gambel's Quail.
"Around Santa Fe. Two specimen on Gila River, Oct. 25."
(Henshaw.)—"Resident and abundant throughout San
Miguel Co." (Mitchell.)—"A common resident in large
flocks around Silver City." (Hunn.)—"One bird was
seen all winter, Shiprock Agency." (Gilman.)—"Common
resident, Mesilla Valley. (Ford.)—"Southwestern New
Mexico." (A. O. U. Check List.)
58. *Cyrtonyx montezumae mearnsi*. Mearn's Quail.
"One pair seen April 14 and May 12, Gila Basin."
(Stephens.)—"Found in New Mexico as far north as Ft.
Tularosa." (Henshaw.)—"Central New Mexico." (A.
O. U. Check List.)

59. *Dendragapus obscurus obscurus*. Dusky Grouse.
 "Generally distributed in Mountains east of Santa Fe." (Henshaw.)—"Common, breeds in May, Hermet Peak, 1000 ft. vicinity of Las Vegas." (Mitchell.) "Seen throughout Canadian and Hudsonian zones, breeding, Pecos Baldy." (Bailey, F.) "Mountains from Santa Fe to Taos." (McCall.)—"Common in Jemez Mts. Flocks come down in autumn. Probably breed in all mountains of North Central New Mexico. (Henderson.)—"Found in Mts. about Santa Fe." (Woodhouse.)—"Seen around Willis in May." (Birtwell.)
60. *Lagopus leucurus leucurus*. White-tailed Ptarmigan.
 "One specimen in Taos Mts. in winter. Two specimens, Wheeler's Peak in July. One specimen, Gold Hill, in Jan. Rather plentiful." (Bailey F.)—"Northern New Mexico." (A. O. U. Check List.)
61. *Centrocercus urophasianus*. Sage-hen.
 "Reaches upper part of New Mexico." (Henshaw.) "North-western New Mexico." (A. O. U. Check List.)
62. *Meleagris gallopavo merriami*. Merriam's Turkey.
 "Common from 8000 ft. to timber line in San Miguel county, breeds in April." (Mitchell.)—"Found all through Mts. east of Santa Fe." (Henshaw.)—"Rather common in Mts. (Gilman.)—"One seen May 19." (Birtwell.)—"Still rather common in mountains near Santa Fe." (Henderson.)—"New Mexico," (A. O. U. Check List.)
63. *Columba fasciata fasciata*. Band-tailed Pigeon.
 "Common in Aug. Mts. east of Santa Fe." (Henshaw.)—"Abundant in Mts. near Silver City." (Hunn.)—"A few seen at 10000 and 11400 ft., Upper Pecos." (Bailey, F.)—"Small flocks seen in New Mexico." (Woodhouse.)—"One specimen, Kingston, Aug. 8. (Met-calf.)—"One specimen, Ruidoso, Aug. (Barber.) "Killed several on Rio Frisco in July." (Wooton.)
64. *Zenaidura macroura macroura*. Mourning Dove.
 "Very abundant in spring and after Aug. 20 in Apache and Hachita ranges." (Anthony.)—"Abundant to 11000 ft., arrives in March, breeds from April to July. San Miguel county. (Mitchell.)—"Common resident, Silver City." (Hunn.) "Voices heard, July 8, Glorieta." (Bailey, F.)—"Numerous and breeding in summer, a few in winter, Navajo Reservation." (Gilman.)—"Seen in Pecos and Willis, April and May." Mentioned in May, Sept. and Dec. around Albuquerque. (Birtwell.)—"Common in canyons and on mesas around Santa Fe." (Henderson.) Very abundant in summer and common in winter in Mesilla Valley. (Ford.)

65. *Melopelia asiatica*. White-winged Dove.
 "One specimen, Gila River, Oct. 28." (Henshaw.)—"South-western New Mexico." (A. O. U. Check List.)
66. *Chaemepelia passerina terrestris*. Ground Dove.
 Have seen a few times in summer in parts of Mesilla Valley.
 "One specimen, Mesilla Park, Aug." (Ford.)
67. *Cathartes aura septentrionalis*. Turkey Vulture.
 "Common after appearance in Aug. Young taken in August, Apache." (Anthony.) "Common in Mts. east Santa Fe." (Henshaw.)—"Not common, occurs to 1200 ft., nests in April, vicinity of Las Vegas." (Mitchell.)—"Common, arrives March 25, leaves in Oct., Silver City." (Hunn.)—"A few at 11000 ft., Upper Pecos." (Bailey, F.)—"Common spring, summer and fall, Navajo Reservation." (Gilman.)—"One specimen May 21, one seen near Albuquerque, Sept. 4 also Oct. 7" (Birtwell.)—"Saw three in Jemez Mts., one at El Rito." (Henderson.)—"Abundant throughout southwest." (Woodhouse.)—"They have been observed in abundance in New Mexico." (Baird.)
68. *Elanoides forficatus*. Swallow-tailed Kite.
 "Accidental west to New Mexico." (A. O. U. Check List.)
69. *Circus Hudsonius*. Marsh Hawk.
 "Abundant around Apache in Sept. and Oct." (Anthony.)—"Common in New Mexico." (Henshaw.)—"Not uncommon in lower part of San Miguel Co., breeds to 8000 ft." (Mitchell.)—"Not uncommon, especially in fall, Silver City." (Hunn.)—"Specimens taken in Jan., May and Oct. around Albuquerque." (Birtwell.)—Resident in Mesilla Valley. (Ford.)
70. *Accipiter velox*. Sharp-shinned Hawk.
 "One seen Sept. 23, Apache." (Anthony.)—"Common in Mts. East of Santa Fe." (Henshaw.)—"One seen Aug. 28 near Las Vegas" (Bailey F.)—"One specimen, Upper Pecos, Aug." (Coghill.)—"One or two seen near Pecos, May; one between San Antonio and Tijeras, Dec. 21, and one specimen, Albuquerque, May 6." (Birtwell.)—"Common resident, Silver City." (Hunn.)—"Specimens, Mesilla Park in March and Ruidoso in Nov." (Barber.)—"Winter resident Mesilla Valley. (Ford.)
71. *Accipiter Cooperi*. Coopers Hawk.
 "Common in Mts. east of Santa Fe." (Henshaw.)—"Common breeds to 11000 ft., San Miguel Co." (Mitchell.)—"One specimen near Silver City, Mar." (Hunn.)—"One specimen July 4; one killed Tijeras, Dec.; one specimen, Willis, Apr.; seen in May, one specimen, Albuquerque,

- Sept. 16." (Birtwell.)—"One young specimen, Upper Pecos, 8000 ft., Aug. 19; common." (Coghill)—Pecos Reservation." (Cockrell.)—"One specimen, Mesilla Park, Dec." (Barber.)
72. *Astur atricapillus striatulus*. Western Goshawk.
 "Several seen in fall in Mts. east of Santa Fe." (Henshaw.)
 —"Specimens Jan. 9 and Mar. 7, vicinity of Las Vegas." (Mitchell.)—"Specimens in Mimbres Mts. and one in a shop, Silver City." (Hunn.)—"In Mts. south to New Mexico." (A. O. U. Check List.)
73. *Parabuteo unicinctus harrisi*. Harris's Hawk.
 "Southern New Mexico." (A. O. U. Check List.)
74. *Buteo Borealis calurus*. Western Red-tail.
 "Common after Sept. until Apr., Apache." (Anthony.)—
 "Resident and very numerous in Mts. east of Santa Fe." (Henshaw.)—"Fairly common to timber line, breeds in Apr., vicinity of Las Vegas." (Mitchell.)—"Seen about camp and at 11000 ft., Upper Pecos." (Bailey, F.)—"Fairly common all over plateaus near Santa Fe." (Henderson.)—"A few seen Mar. 28, Willis. One seen Nov. 29, Tijeras. One specimen, Albuquerque, Apr. 14." (Birtwell.)—"Fairly common along river in Mts., breeds, Navajo reservation." (Gilman.)—"Common resident, Silver City." (Hunn.)—"One specimen, White Mts." (Barber.)—"Type specimen near Fort Webster, N. M." (A. O. U. Check List.)
75. *Buteo abbreviatus*. Zone-tailed Hawk.
 "Plentiful in Apr., a few in summer, Apache." (Anthony.)
 —"Southwestern New Mexico on Gila River, one specimen." (Stephens.)—"New Mexico." (A. O. U. Check List.)
76. *Buteo swainsoni*. Swainson's Hawk.
 A few in summer and winter, abundant in spring and fall, when migrating, Apache Range." (Anthony.)—"Common breeds to 1000 ft, vicinity of Las Vegas." (Mitchell.)—"Noticed among groves but not numerous, Navajo Reservation." (Gilman.)—"One seen, Albuquerque, Sept. 19." (Birtwell.)—"One specimen, Mesilla Park, Apr. and nest taken with two eggs in May. (Ford.)
77. *Archibuteo lagopus sancti-johannis*. Rough legged Hawk.
 "Southern New Mexico." (A. O. U. Check List.)
78. *Archibuteo ferrugineus*. Ferruginous Rough-leg.
 "Northern New Mexico, numerous in Nov." (Henshaw.)
 "Not uncommon on plains near Silver City." (Hunn.)
 —"Three seen on Navajo reservation." (Gilman.)

79. *Aquila chrysaetos*. Golden eagle.
 "Rather common as a summer resident in the Mts., east of Santa Fe." (Henshaw.) "Common, nests in Mar., to timber line in vicinity of Las Vegas." Mitchell.) "Several seen, one young, on Pecos Baldy, Aug. 18." (Bailey, F.)—"Seen occasionally, one nest, Navajo Reservation." (Gilman.)—"Common in Mogollon Mts., breeds in bluffs in Apr." (Metcalf.)—"Common in Mts., occasionally seen in fall and winter on plains near Silver City." (Hunn.)—One specimen, Doña Ana Mts., Jan. (Ford.)
80. *Haliaeetus leucocephalus leucocephalus*. Bald Eagle.
 "Rare in summer, Fort Bayard." (Wilson.)—"Seen at 8000 ft., Pecos Mts., Aug." (Bailey, F.)—"One seen near Albuquerque, Feb. 12." (Birtwell.)—"One pair, El Rito, Aug. 19." (Henderson.)
81. *Falco mexicanus*. Prairie Falcon.
 "One seen, Apache." (Anthony.)—"Seen at several places on Gila River in Nov." (Henshaw.) "Fairly common in eastern part of San Miguel county, breeds to 9000 ft. in May." (Mitchell.)—"A few but rather rare, Navajo Reservation." (Gilman.)—"One seen, Albuquerque, Jan. 25." (Birtwell.)
82. *Falco peregrinus anatum*. Duck Hawk.
 "Two seen, and one taken sixty years ago at Santa Fe." (Henderson.)
83. *Falco columbarius columbarius*. Pigeon Hawk.
 "Not uncommon in Mts. east of Santa Fe." (Henshaw.)—"Two seen, one killed, Navajo Reservation, July 4." (Gilman.)
84. *Falco columbarius richardsoni*. Richardson's Pigeon Hawk.
 "One specimen, three others seen, winter, Silver City." (Hunn.)
85. *Falco fusco-caerulescens*. Aplomado Falcon.
 "One pair seen between Apache and Hachita, June 2." (Anthony.)—"New Mexico." (A. O. U. Check List.)
86. *Falco sparverius phalaena*. Desert Sparrow Hawk.
 "Abundant during migration in Apache and Hachita region." (Anthony.)—"Fairly common in summer at Fort Bayard." (Wilson.)—"Common resident, less so in winter, Silver City." (Hunn.)—"Glorieta July 8, Truchas Peak, 13,300 ft., Pecos Baldy 12,600 ft., Aug." (Bailey, F.)—"Common in Aug. and Sept. around Albuquerque, also seen Oct. and Dec. One seen Mar. 26, Galisteo." (Birtwell.)—"Common in canyons and on

- mesas around Santa Fe." (Henderson.) "One specimen, Ruidoso." (Barber.)—Common the year around in Mesilla Valley. (Ford.)
87. *Pandion haliaetus carolinensis*. Osprey.
 "Frequently seen in spring and summer in Apache and Hachita regions, one specimen Apr. 14." (Anthony.)—"Several seen in fall in Mts. east of Santa Fe." (Henshaw.)—"One specimen, Gila River, Sept. 17." (Henshaw.)—"One specimen, Roswell, Oct." (Barber.)
88. *Aluco pratincola*. Barn Owl.
 "One specimen, Silver City, Sept. 2." (Hunn.)—One specimen, Manhus Springs, May; One specimen, Mesilla Park, June 16; others reported from around Las Cruces. (Ford.)
89. *Asio wilsonius*, Long-eared Owl.
 "One specimen, Little Hachita, Apr. 30." (Anthony.)—"Rare, breeds to 11000 ft. in April, vicinity of Las Vegas." (Mitchell.)—"Five seen, Jan. 18, Silver City." (Hunn.)—"Two seen several times, Navajo Reservation." (Gilman.)—One specimen, Mesilla Park. (Ford.)
90. *Asio flammeus*. Short-eared Owl.
 One specimen, Tortugas Mt., Mar. (Ford.)
91. *Strix occidentalis occidentalis*. Spotted Owl.
 "One specimen, Mts. east of Santa Fe, Aug. 20." (Henshaw.)—"Two seen twenty miles from Las Vegas, Apr. 9, 500 ft." (Mitchell.)—"One pair nested at El Rito." (Henderson.)—"Abundant near streams in New Mexico. (Woodhouse.)—"New Mexico." (A. O. U. Check List.)
92. *Cryptoglaux acadica acadica*. Saw-whet Owl.
 One specimen, Mesilla Park. (Ford.)—"New Mexico." (A. O. U. List.)
93. *Otus asio mcalli*. Texas Screech Owl.
 "Common, breeds to timber line, vicinity of Las Vegas. (Mitchell.)
94. *Otus asio cineraceus*. Mexican Screech Owl.
 "Common resident, Silver City." (Hunn.)—"New Mexico." (A. O. U. List.)
95. *Otus asio aikeni*. Aiken's Screech Owl.
 "South probably to New Mexico." (A. O. U. Check List.)
 "One specimen, Mangus Springs, Jan 16, a few always in summer." (Metcalf.)
96. *Bubo virginianus pallascens*. Western Horned Owl.
 "Common in Apache and Hachita ranges." (Anthony.)—"Numerous in Mts. east of Santa Fe." (Henshaw.)—"Common resident, one nest Apr. 20, Silver City."

- (Hunn.)—"Heard in Pecos Mts. and at Solitario. One specimen, Glorieta; heard at 8000 and 11000 ft." (Bailey, F.)—"Heard several times on Navajo Reservation." (Gilman.)—"Common resident at Mangus Springs." (Metcalf.)—One specimen, Ruidoso, Aug. (Barber.)—One specimen, Mesilla, Feb. (Ford.) "New Mexico." (A. O. U. Check List.)
97. *Bubo virginianus subarcticus*. Arctis Horned Owl.
"One specimen, Albuquerque, Nov. 18." (Birtwell.)
98. *Bubo virginianus saturatus*. Dusky Horned Owl.
"One specimen, Albuquerque, Dec. 19." (Birtwell.)—"In the Mts. of New Mexico." (A. O. U. Check List.)
99. *Speotyto sunicularia hypogaea*. Burrowing Owl.
"Common in Apache and Hachita ranges." (Anthony.)—"Resident of New Mexico but not abundant." (Henshaw.)—"Abundant, breeds to 8000 ft. and in May and June, San Miguel Co." (Mitchell.)—"Locally common, Silver City." (Hunn.)—"Seen on mesas, one family, Navajo Reservation." (Gilman.)—"Seen occasionally from Val Verde to Santa Fe." (McCall.)—"Found abundantly in New Mexico." (Woodhouse.)—"Very common resident in Mesilla Valley." (Ford.)
100. *Glaucidium gnoma gnoma*. Pygmy Owl.
"Type specimen, Alma, Dec. 25." (A. O. U. Check List.)—"Numerous in Mts. east of Santa Fe. Common in New Mexico." (Henshaw.)—"New Mexico." (A. O. U. Check List.)
101. *Micropallas whitneyi*. Elf Owl.
"One specimen near Apache, Sept. 6." (Anthony.)
102. *Geococcyx californianus*. Road-runners.
"Not uncommon at Hachita and in Little Hachita Mts." (Anthony.)—"Abundant, breeding in May, Fort Bayard." (Wilson.)—"Common in southern New Mexico." (Henshaw.)—"Common resident around Silver City." (Hunn.)—"Seen occasionally on mesas around Santa Fe." (Henderson.)—"Common resident all over Mesilla Valley." (Ford.)
103. *Ceryle alcyon*. Belted Kingfisher.
"One seen near Apache, Sept. 23." (Anthony.)—"Found occasionally in N. M. Several seen in fall in Mts. east of Santa Fe." (Henshaw.)—"One seen Dec. 26, Las Vegas Hot Springs." (Batchelder.)—"Fairly common, breeds to 9000 ft., San Miguel Co." (Mitchell.)—"Found along Pecos July 11 to 16, to 7800 ft. 8000 ft." (Bailey F.)—"Seen in Willis, Apr. and May." (Birtwell.)—"Gallinos River, Kronig Lakes." (Cockerell.)—

- "A few seen in spring and fall near Silver City." (Hunn.)
104. *Dryobates villosus hyloscopus*. Cabanis's Woodpecker.
 "Fairly common in summer at Fort Bayard." (Wilson)
 —"Rather common from Sept. to May around Silver City." (Hunn.)—"Central New Mexico." (A. O. U. Check List.)—"One specimen, Kingston, Nov. 1." (Metcalf.)—"One specimen, Ruidoso, Sept." (Barber.)
105. *Dryobates villosus monticola*. Rocky Mountain Hairy Woodpecker.
 "Numerous summer resident in Mts. east of Santa Fe. (Henshaw.)—"Two or three seen, Las Vegas Hot Springs, Dec." (Batchelder.)—"Abundant to timber line, breeds in May, San Miguel Co." (Mitchell.)—"Seen 7400 ft. to 11000 ft. one family, Aug. 15, Upper Pecos." (Bailey F.)—"Resident on Navajo Reservation." (Gilman.)—"Common throughout Mts., mesas and canyons around Santa Fe." (Henderson.)—"One seen in Albuquerque, Jan. 27." (Birtwell.)—"New Mexico." (A. O. U. Check List.)
106. *Dryobates pubescens gairdeneri*. Gairdener's Woodpecker.
 "Common throughout New Mexico." (Woodhouse.)—"One specimen, Willis, April 12." (Birtwell.)
107. *Dryobates pubescens homorus*. Batchelder's Woodpecker.
 "Not uncommon as summer residents in Mts. east of Santa Fe." (Henshaw.) "One adult male seen, Las Vegas Hot Springs, Dec. 18." (Batchelder.)—"Seen April 12 and in May at 9000 ft., Willis." (Birtwell.)—"Nesting near river, not numerous, Navajo Reservation." (Gilman.)
108. *Dryobates scalaris bairdi*. Texas Woodpecker.
 "Common on yuccas and agaves, Apache, nest of four or five young in May." (Anthony.) "Moderately common in summer around Fort Bayard." (Wilson.)—"Very common resident around Silver City." (Hunn.)—"One specimen, Tijerhas, Jan. 17. Observed in Albuquerque, Sept. 19 and Oct. 14." (Birtwell.)—"One specimen, Kingston, July 10. (Metcalf.)—Resident in Mesilla Valley. (Ford.)
109. *Dryobates arizonae*. Arizona Woodpecker.
 "Southwestern New Mexico." (A. O. U. Check List.)
110. *Picoides americanus dorsalis*. Alpine Three-toed Woodpecker.
 "Common resident in Mts. east of Santa Fe." (Henshaw.)

- "One pair and young at 11600 ft., Upper Pecos, Aug. 14." (Bailey, F.)—"New Mexico, high mountains." (A. O. U. Check List.)
111. *Sphyrapicus varius nuchalis*. Red-naped Sapsucker.
 "Common summer and fall resident in Mts. east of Santa Fe." (Henshaw.)—"Common, breeds from 9000 to 12000 ft." San Miguel Co." (Mitchell.)—"Seen on Pecos in Transition Zone at 8000 ft." (Bailey, F.)—"One specimen, Upper Pecos, June 24, rare. One young, Albuquerque, Jan. 9, one seen Sept. 19." (Birtwell.)—"Fairly common around Silver City in winter and spring." (Hunn.)—"Central New Mexico. Type, Mimbres River." (A. O. U. Check List.)—"Two specimens, Kingston, Nov. 1. (Metcalf.)
112. *Sphyrapicus thyroides*. Williamson's Woodpecker.
 "One seen near Hachita, Sept. 30." (Anthony.)—"Common summer and fall resident in Mts. east of Santa Fe. Three specimens on Gila River, Nov. 5." (Henshaw.)—"Abundant, breeds from 7000 to 11000 ft., San Miguel Co." (Mitchell.) "Two specimens 8000 ft.; seen 9000 ft., Upper Pecos, July." (Bailey, F.)—"Ranges south as far as New Mexico. Winters in New Mexico." (Henderson.)—"Upper Pecos July." (Cockerell.)—"Two young males seen on Navajo Reservation." (Gilman.) "Reported from Tijeras, Jan. and Mar.; Upper Pecos, May, June and July, fairly common; Willis, Mar.; Albuquerque, Sept. and Oct." (Birtwell.)
113. *Melanerpes erythrocephalus*. Red-headed Woodpecker.
 "Reported from Hall's Peak." (Cockerell.)—"Casual in New Mexico." (A. O. U. Check List.)
114. *Melanerpes formicivorus formicivorus*. Ant-eating Woodpecker.
 "Common resident from Pinos Altos north." (Hunn.)—"First seen Aug. 27, then became numerous." (Henshaw.)—"One specimen, Fort Wingate, Aug. 6." (Shufeldt.)—"Common, breeds from 8000 to 10000 ft., San Miguel Co." (Mitchell.)—"One seen near Glorieta, July 8." (Bailey, F.)—"Northern New Mexico." (A. O. U. Check List.)—"Three specimens, Kingston, Aug. 7. (Metcalf.)—"One specimen, Mescalero, July. (Barber.) One specimen, Albuquerque, Aug. and one Copper Mines Aug. (Birtwell.)
115. *Asyndesmus lewisi*. Lewis's Woodpecker.
 "A number seen at Ft. Wingate, May 8." (Shufeldt.)—"Rather common in flocks, Pinos Altos." (Hunn.)—"One seen, June 25, Mesa del Agua de la Yegua; one Sept. 4, Soltario Peak." (Bailey, F.)—"Two speci-

- mens, Upper Pecos, 8000 ft., July. Rare." (Coghill.)
One specimen, Ruidoso, Aug. (Barber.)—"One killed near Albuquerque, Sept. 25." (Birtwell.)—"New Mexico." (A. O. U. Check List.)
116. *Centurus uropygialis*. Gila Woodpecker.
"Southwestern New Mexico, two specimens, Pueblo Viego, Sept. 19." (Henshaw.) "Southwestern New Mexico." (A. O. U. Check List.)
117. *Colaptes cafer collaris*: Red-Shafted Flicker.
"Common in winter and spring, not seen after April, Apache." (Anthony.)—"Widest diffusion of any family. Common summer resident in Mts. east of Santa Fe." (Henshaw.)—"A half dozen or so seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Abundant, breeds to timber line, May and June, San Miguel Co." (Mitchell.)—"Fairly common, 7400 to 11600 ft., young seen Aug. 16, Upper Pecos." (Bailey, F.)—"Winter and spring and numerous in summer, Navajo Reservation." (Gilman.)—"Common resident, Silver City." (Hunn.)—"in Mts., "Common mesas and canyons near Santa Fe." (Henderson.)—"Seen breeding, Mch., Apr. and May, Willis: specimens from Albuquerque, Feb., seen Sept. and Oct.; reported by Coghill from Upper Pecos as common in June. Gregarious in August." (Birtwell.)
118. *Antrostomus vociferus macromystax*. Steven's Whip-poor-will.
"Uncommon, breeding July 15, Ft. Bayard." (Wilson.)—"Southern New Mexico." (A. O. U. Check List.)
119. *Phalaenoptilus nuttalli nuttalli*. Poor-will.
"Tolerably common, breeds 10000 ft., in June, San Miguel Co." (Mitchell.)—"Heard near Glorieta in July." (Bailey, F.)—"Heard in Jemez Mts., Aug. 18." (Henderson.)—"Reported from Ft. Wingate." (Birtwell.)—"One specimen, Kelley, May 10. (Herrick.)
120. *Phalaenoptilus nuttalli nitidus*. Frosted Poor-will.
"Not uncommon about Apache, after April 6, one seen in Sierra Hachita as late as Nov. 24." (Anthony.)—"One specimen, Kingston, July 7. (Metcalfe.)
121. *Chordeiles acutipennis texensis*. Texas Nighthawk.
"Swarmed in June and July around Deming. One seen at Apache May 17." (Anthony.)
122. *Chordeiles virginianus henryi*, Western Nighthawk.
"Two seen flying south, July 26; one specimen Aug. 18, Apache." (Anthony.) "Abundant, breeds to 10000 ft., San Miguel Co." (Mitchell.)—"Heard near Glorieta, July 8." (Bailey, F.)—"A few in spring and summer

- on Navajo Reservation." (Gilman.)—"Hundreds seen on mesas on a cloudy day." (Henderson.)—"Hop Canyon, June 20, seen a number of times; one specimen, Albuquerque, Sept. 16; one Magdalena, June." (Birtwell.)
123. *Cypseloides niger borealis*. Black Swift.
 "One specimen seen in Mts. east of Santa Fe in Sept." (Henshaw.)
124. *Aeronautes melanoleucus*. White-throated Swift.
 "A few seen in Hachita in April and from Oct. 1 to 15 in Hachita." (Antony.) "Inscription Rock and one specimen at Ft. Wingate, July 13." (Henshaw.)—"Not common, breeds in May to timber line, San Miguel Co." (Mitchell.)—"One seen flying over Pecos Baldy, July 31." (Bailey, F.)—"Common on rim of Rio Grande below El Rito." (Henderson.)
125. *Eugenes fulgens*. Rivoli's Hummingbird.
 "Mountains of Southwestern New Mexico." (A. O. U. Check List.)
126. *Cyanolaemus clemenciae*. Blue-throated Hummingbird.
 "Southwestern New Mexico." (A. O. U. Check List.)
127. *Archilochus alexandri*. Black-chinned Hummingbird.
 "Not uncommon in Aug., one specimen in July, Apache." (Anthony.)—"Common to 8000 ft., breeds in June, San Miguel Co." (Mitchell.)—"Fairly common near river, more numerous in Mts., Navajo Reservation." (Gilman.)
128. *Calypte costae*. Costa's Hummingbird.
 "Southwestern New Mexico." (A. O. U. Check List.)
129. *Selasphorus platycercus*. Broad-tailed Hummingbird.
 "Only hummer present during migration, abundant in Aug., Apache." (Anthony.) "Common summer resident in Mts., east of Santa Fe, one specimen, Inscription Rock, July 24." (Henshaw.)—"Common, arrives in May, breeds to 9000 ft., San Miguel Co." (Mitchell.)—"Common, Glorieta 7000 ft., Pecos Baldy 11600 ft., as late as Aug. 16." (Bailey, F.)—"Only a few seen on Navajo Reservation." (Gilman.)—"Many seen in Willis in May and common same month in Albuquerque, one specimen in Sept." (Birtwell.)
130. *Selasphorus rufus*. Rufous Hummingbird.
 "Noticed last July, hundreds in Aug., Apache." (Anthony.)—"Common summer resident in Mts. east of Santa Fe. Three specimens, Inscription Rock, July 24; one Deer Springs, July 25." (Henshaw.)—"One specimen, Pecos Mts., Aug. 25, one Las Vegas, Aug. 29. A large number were seen 12600 ft., Truchas Peak, Pecos

Mts., Aug. 25." (Bailey, F.)—"Nesting in June, Wil-
lis. Twenty-two specimens in Sept., Albuquerque, study-
ing coloration." (Birtwell.)—"Very common in El
Rito." (Henderson.)—Three specimens, Kingston, Aug.
9. (Metcalf.)

131. *Stellula calliope*. Calliope Hummingbird.
 "Abundant after July 15, when first seen, Apache." (An-
thony.)—"Common summer resident in Mts., east of
Santa Fe. Six specimens, Inscription Rock, July and
August." (Henshaw.)—"One specimen three miles south
of Pecos, Aug. 25. Two specimens, Upper Pecos, 11000
ft., Aug. 8." (Bailey, F.)—"Six specimens, Alberquer-
que." (Birtwell.)
132. *Cyanthus latirostris*. Broad-billed Hummingbird.
 "Southwestern New Mexico." A. O. U. Check List.)
133. *Tyrannus tyrannus*. Kingbird.
 "Between La Cuesta and Sena, June 30, and Ribera, July
2." (Bailey, F.)—"Northern New Mexico." (A. O. U.
Check List.)
134. *Tyrannus verticalis*. Arkansas Kingbird.
 "Common during migrating season, Apache and Hachita
ranges." (Anthony.)—"Not uncommon at Ft. Win-
gate." (Henshaw.)—"Common, nests in June to 9000
ft., San Miguel Co.," (Mitchell.)—"Common during
spring migration after Apr. 12, Silver City." (Hunn.)
—Specimens, Albuquerque, Sept. 10 and Apr. 14. (Birt
well.)—One specimen, Ruidoso, (Barber.)
135. *Tyrannus vociferans*. Cassin's Kingbird.
 "Common during migrating season, Apache and Hachita
ranges." (Anthony.)—"Very abundant, breeds, Ft.
Bayard." (Wilson.)—"Specimens, Ft. Wingate, July
15, Neutria, July 19, Inscription Rock, July 23." (Hen-
shaw.)—"Common in San Miguel Co. Reported from
Glorieta, July 8, 8000 ft." (Bailey, F.)—"A few seen in
spring on Navajo Reservation." (Gilman.)—"Arrives
in Apr., common, breeds, leaves in Oct., Silver City."
(Hunn.)—"Seen near Albuquerque Apr. 14 and Sept 20."
(Birtwell.)
136. *Myiarchus crinitus*. Crested Flycatcher.
 "One male specimen, Gila River, June 12." (Stephens.)
137. *Myiarchus magister magister*. Arizona Crested Fly-
catcher.
 "Southwestern New Mexico." (A. O. U. Check List.)
138. *Myiarchus cinerascens cinerascens*. Ash-throated Fly-
catcher.
 "Abundant after Apr. 14, Apache." (Anthony.)—"Three
specimens, Ft. Wingate, July 15 and 16, one specimen,

- Inscription Rock, July 23." (Henshaw)—"Common in Junipers in June, San Miguel Co. Juniper belt, near Glorieta, July 8, (Bailey, F.)—"Abundant everywhere, Shiprock." (Gilman.)—"Arrives May 6, a few seen, Silver City." (Hunn.)
139. *Sayornis phoebe*. Phoebe.
 "A number seen in May near Santa Rosa." (Bailey, F.)—"Northwestern New Mexico." (A. O. U. Check List.)
140. *Sayornis sayus*. Say's Phoebe.
 "Common after spring migration, Mar. 12, nest taken May 26, none seen after June 1, till Aug. 30, Apache." (Anthony.)—"One specimen, Santa Fe, July 10, two specimens Ft. Wingate, July 15." (Henshaw.)—"Ft. Union, Mar. 22." (Coale.)—Common, arrives last of Mch., breeds, San Miguel Co." (Mitchell.)—"Seen Aug. 14, 12000 ft., Upper Pecos. One seen near Glorieta, July 8." (Bailey, F.)—"Not numerous but seen on plains and in Mts., Shiprock." (Gilman.)—"Two seen daily, El Rito." (Henderson.)—"Seen Mch. 13, Sept. 10 and 19, Albuquerque; Mch. 27, Pecos; April and May, Willis, Feb. 27, Tijeras." (Birtwell.)—"Common resident, less so in winter, Silver City." (Hunn.)—"Common summer resident, Mangus Springs." (Metcalf.)—Very common summer resident all over Mesilla Valley. (Ford.)
141. *Sayornis nigricans*. Black Phoebe.
 "Migrating during Mch. and Apr., not common, Silver City." (Hunn.)—Two specimens, Kingston, Aug. 8. (Metcalf.)—"Southern New Mexico." (A. O. U. Check List.)
142. *Nuttallornis borealis*. Olive sided Fly-catcher.
 "Several seen Sept. 6. Apache." (Anthony.)—"Common summer resident in Mts. east of Santa Fe." (Henshaw.)—"Common in Pecos Mts. in Canadian and Hudsonian Zones, Willis Creek 7800 to Pecos Baldy 11600 ft." (Bailey, F.)—"Numerous spring migrant, May and June, Shiprock." (Gilman.)—"One specimen, Willis, May 23." (Birtwell.)—"One specimen, Sawyer's Peak, Aug. 11 and one Kingston, Aug. 11." (Metcalf.)
143. *Myiochanes richardsoni richardsoni*. Western Wood Pewee.
 "Seen only in fall, Aug. 11 and Sept. 30, Apache." (Anthony.)—"Numerous in summer in Mts. east of Santa Fe." (Henshaw.)—"Near Canadian River, June 21, breeding. Ribera Aug. 25. Transition Zone, Upper Pecos, 7000 ft. to 8000 ft." (Bailey F.)—"Specimens May 23 and June 1, Willis. Common on Upper Pecos

- at 8000 ft. in July. Abundant in May in Albuquerque." (Birtwell.)—Common in Frijoles Canyon." (Henderson.)
 —"Fairly common, breeds, Fort Bayard." (Wilson.)
144. *Empidonax difficilis difficilis*. Western Flycatcher.
 "One specimen, May 12, a few seen and taken in Aug. and Sept., Apache" (Anthony.)—"Rather common along water in summer in Mts east of Santa Fe." "Specimens from Ft. Wingate and Inscription Rock, July, and southern Apache, Sept. 8." (Henshaw)—Rare, breeds sparingly to 1000 ft., San Miguel Co." (Mitchell.)—"Common from 8000 to 11000 ft., breeding, Upper Pecos, July 15." (Bailey F.)—"Two seen, one killed, Willis, May 28, also seen at Datil May 28." (Birtwell.)
145. *Empidonax trailli trailli*. Traill's Flycatcher.
 "A few taken from July 30 to Sept. 6, Apache." (Anthony.)
 —"New Mexico included in range." (Henshaw.)—
 "Southern New Mexico." (A. O. U. Check List.)
146. *Empidonax hammondi*. Hammond's Flycatcher.
 "A few taken from Aug. 31 to Sept. 15, Apache." (Anthony.)—"Specimens Rio Grande, June 14; Ft. Bayard and Navajo Creek, Sept." (Henshaw.)
147. *Empidonax wrighti*. Wright's Flycatcher.
 "Abundant from Apr. 6 to 30 and from Aug 18 to Sept. 16, Apache." (Anthony.)—"Summer resident, not common in Mts. east of Santa Fe. Specimens from Ft. Wingate and Inscription Rock, July, also Santa Fe, July." (Henshaw.)—"Common, breeds usually 9000 ft., San Miguel Co." (Mitchell.)—"Seen frequently in Apr.; and May, Shiprock." (Gilman.)—"Common during spring, Apr. and May, Silver City." (Hunn.)
148. *Empidonax fulvifrons pygmaeus*. Buff-breasted Flycatcher.
 "One specimen Aug. 16, several seen, Apache." (Anthony.)
 —"Four specimens, Inscription Rock, July 24." (Henshaw.)—"Southern New Mexico." (A. O. U. Check List.)
149. *Pyrocephalus rubinus mexicanus*. Vermillion Flycatcher.
 "Arrived in Apr. also noted in Sept., Silver City." (Hunn.)
 —"Southern New Mexico." (A. O. U. Check List.)
150. *Otocoris alpestris adusta*. Scorched Horned Lark.
 "Common on plains and valleys, Apache and Hachita ranges" (Anthony.)—"Small flocks seen in Sept. and Dec. around Albuquerque." (Birtwell.)—"Southwestern New Mexico." (A. O. U. Check List.)

151. *Otocoris alpestris occidentalis*. Montezuma Horned Lark.

"Abundant throughout the year around Silver City" (Hunn.)—"Found on the plains in south central part of New Mexico." (Bailey F.)—"Type specimen, Santa Fe." (A. O. U. Check List.)

152. *Otocoris alpestris leucolaema*. Desert-Horned Lark.

"Rather common on plains in Dec., around Las Vegas Hot Springs." (Batchelder.)—"A large flock, several specimens, Ft. Union, Mch. 22." (Coale.)—"Abundant Breeds from 8000 ft., down, San Miguel Co." (Mitchell.)—"Six or more seen, 12000 ft., two specimens, Upper Pecos, July 28." (Bailey, F.)—"Ft. Wingate, Ft. Massachusetts, Ft. Thorne, Carlsbad, Roswell, La Plata, Deming, Silver City, Albuquerque." (Oberholser.)—"Specimens, May, Oct., Dec., Albuquerque: Feb., Socorro, Upper Pecos. (Birtwell.)—"To be seen on College campus from Dec. to Mch. (Ford.)—"Northern New Mexico" (A. O. U. Check List.)

153. *Pica pica Hudsonia*. Magpie.

"One specimen, Rio Puerco, 60 miles west of Ft. Wingate." (Henshaw.)—"Common from 7000 ft. up, breeds to 12000 ft., San Miguel Co." (Mitchell.)—"Four seen, Aug. 6, 10400 ft., Upper Pecos." (Bailey, F.)—"Six or eight seen, Sep. 3, Schromberg." (Birtwell.)—"a few in New Mexico." (Woodhouse.)—"Common along river, breeds, Shiprock." (Gilman.)—"Northern New Mexico." (A. O. U. Check List.)

154. *Cyanocitta cristata cristata*. Blue Jay.

"Casual in New Mexico." (A. O. U. List.)

155. *Cyanocitta stelleri diademata*. Long-crested Jay.

"Numerous resident in Mts. east of Santa Fe. Found in Southern New Mexico." (Henshaw.)—"Common among pines in Dec., Las Vegas Hot Springs." (Batchelder.)—"Most abundant bird in San Miguel Co., breeds to 10000 ft." (Mitchell.) "Family seen July 8. near Glorieta, 11000 ft." (Bailey, F.) "Several seen in Mts. in July, Shiprock." (Gilman.)—"Seen and collected in Albuquerque, Jan., Mch., May, Sep. and Dec.: Glorieta, Dec. 25; Willis, Apr. and May." (Birtwell.) "Common all over region around Santa Fe." (Henderson.)—"Common in Sacramento, White and Mogollon Mts. (Wooton.)—"Common about Pinos Altos." (Hunn.)—"Two specimens, Kingston, Nov. 12. (Metcalf.)

156. *Aphelocoma woodhousei*. Woodhouse's Jay.

"Common in piñon growth, Apache and Animas ranges." (Anthony.)—"Common, breeds in May to 8000 ft., San

- Miguel Co." (Mitchell.)—"As high as 7000 ft., Upper Pecos," (Bailey, F.)—"One seen on river Feb. 2; in Mts. July 2; Shiprock in Aug." (Gilman.)—"Seen and specimens secured, Tijerhas, Jan. 21, plentiful in March, seen in Nov.; Albuquerque, Sept. 6 and 10 and Oct." (Birtwell.) "Abundant on mesas near Santa Fe." (Henderson.)—"Common resident about Silver City." (Hunn.)—One specimen, Ruidoso, Nov. (Barber.)—One specimen, Kingston, Aug. 8. (Metcalf.)
157. *Amphelocoma siberi siberi*. Arizona Jay.
 "Ft. Buchanan, Copper Mines, Ft. Bayard." (Henshaw.)—"Common resident, Silver City." (Hunn.)—"Southern New Mexico." (A. O. U. Check List.)
158. *Perisoreus canadensis capitalis*. Rocky Mountain Jay.
 "Common in summer above 8000 ft. in Mts. east of Santa Fe." (Henshaw.) "Common, found only from 9000 ft. up, San Miguel Co." (Mitchell.)—"Common from 11000 to 11600 ft., as low as 10800, breeds, Upper Pecos." (Bailey, F.)—"One specimen, Upper Pecos, Aug., common at 10000 ft. and up; one seen at Willis May 9." (Birtwell.)—"New Mexico." (A. O. U. Check List.)
159. *Corvus corax sinuatus*. Raven.
 "Common throughout Apache and Hachita regions." (Anthony.)—"Rather common, breeds in higher Mts. east of Santa Fe." (Henshaw.)—"Abundant from 8000 ft. up, breeds in May, San Miguel Co." (Mitchell.)—Family, near Glorieta, July 10, Pecos Baldy, 11600 ft., breeding July 23." (Bailey, F.)—"Common in New Mexico." (Woodhouse.)—"Frequently seen, Albuquerque, Jan., May, March, Sept.; a few seen in March, Tijerhas; plentiful in March, Galisteo." (Birtwell.) "Casual, Silver City." (Hunn.)—"Fairly common, breeds, Shiprock." (Gilman.) One specimen, Ruidoso, Oct. 14. (Barber.)
160. *Corvus cryptoleucus*, White-necked Raven.
 "Very common in Apache and Hachita regions. Nests with young were common in July and Aug." (Anthony.)—"Resident, large flocks, Silver City." (Hunn.)—"New Mexico." (A. O. U. Check List.—One specimen, Mesilla Park. (Barber)—Common resident in Mesilla Valley, a pest on apples, 1902. (Ford.)
161. *Corvus brachyrhynchos brachyrhynchos*. Crow.
 "Saw a dozen or so, one killed, Rio Mimbres, in Apr." (Sepphens.)—"One specimen at mouth of Navajo Creek, Sept. 11." (Henshaw.)—"Seen at El Macho, Ribera, Bernal and Las Vegas." (Bailey F.)—"A number seen and heard in Jemez Mts." (Henderson.)—Abundant in

- New Mexico." (Woodhouse.)—"Seen at Willis and Pecos, Mch., Apr., and May and two seen at Tijerhas, Nov. 28 and flocks Nov. 29." (Birtwell.)—"Common year around, Mangus Springs." (Metcalf.)—"One specimen, Ruidoso, Oct. 14." (Barber.)—"A few but not common Mesilla Valley" (Ford.)
161. *Corvus brachyrhynchos hesperis*. Western Crow.
 "A few seen in Oct. in Mts. east of Santa Fe." (Henshaw.)—"Abundant in New Mexico." (Woodhouse.)—"One specimen, Ruidoso, Oct. 14. (Barber.)—"A resident in Mesilla Valley but not common. (Ford.)
163. *Nucifraga columbiana*. Clark's Nutcracker.
 "Numerous in pines in fall, breeds higher up, Mts. east of Santa Fe." (Henshaw.)—"Common from 9000 ft. to timber line, San Miguel Co." (Mitchell.)—"Canadian and Hudsonian Zones, July and Aug., common also at 6000 8000 ft., Upper Pecos." (Bailey F.)—"Several seen in Jemez Mts., two in Alamo Canyon," (Henderson.)—"Two seen in Oct., one specimen in July, Chucas." (Gilman.)—"Seen at Willis Mar. 28, common Apr. and May; one specimen, Upper Pecos, Aug., Gregarious in Aug., abundant in timber." (Birtwell.)—"One specimen, Ruidoso, Sept." (Barber.)
164. *Cyanocephalus cyanocephalus*. Piñon Jay.
 "Resident on river, piñon groves, Mts. east of Santa Fe. One specimen, Ft. Wingate, July 16, two specimens Ft. Amarilla, Sept. 5." (Henshaw.)—"Common from 8000 ft. up, nests in May, San Miguel Co." (Mitchell.)—"Flock 7000 ft. six or eight at 12300 ft., Truchas Peak." (Bailey, F.)—"Two flocks seen at Shiprock. Common in Mts." (Gilman.)—"Abundant fall migrant, a few in winter." Pinos Altos." (Hunn.)—"Seen Oct 14, a flock of over one hundred, also seen Feb., Mch. May and Sept., Tijerhas; a flock in Albuquerque, Sept. 10; flocks seen Mch. 27 Pecos, and Glorieta, Dec. 24; one specimen, San Antonio, Aug., and Cerillos Aug." (Birtwell.)—"Southern New Mexico." (A. O. U. Check List.)—"One specimen, Ruidoso, Sept. (Barber.)
165. *Molothrus ater obscurus*, Dwarf Cowbird.
 "Rare in spring, common in summer, Apache." (Anthony.)—"Common, breeds, San Miguel Co." (Mitchell.)—"Casual in spring, Silver City." (Hunn.)—"Common, breeds, Shiprock." (Gilman.)—"Ft. Yuma, New Mexico." (Ridgway.)—"Flocks seen May 6, Albuquerque; one specimen, Willis, May 11." (Birtwell.)—"Northern New Mexico." (A. O. U. Check List.)—"Common in spring, summer and fall, Mesilla Valley. (Ford.)

166. *Xanthocephalus xanthocephalus*. Yellow-headed Black bird.
"Rather common in summer, Apache." (Anthony.)—"Abundant in New Mexico." (Henshaw.)—"Common in spring and fall, some in winter, Silver City." (Hunn.)—"Eight were seen, Aug. 29, one mile north of Las Vegas." (Bailey, F.)—"Seen occasionally, Shiprock."—"Reported by Indians as having been seen near San Ildefonso." (Henderson.)—Specimens from Rincon, Feb. 16, and from Ruidoso. (Barber.)—"Seen Apr. 28, Pecos; two specimens Sept. 16, and flocks in May, Albuquerque." (Birtwell.)—One specimen, Kingston, July 15. (Metcalf.)—Common resident in Mesilla Valley. (Ford.)
167. *Agelaius phoeniceus phoeniceus*. Red-winged Blackbird.
"One specimen Apr. 27 and one Oct. 19, Apache." (Anthony.)—"Several flocks seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Generally found in favorable localities in New Mexico." (Henshaw.)—"Common, breeds to 9000 ft., San Miguel Co." (Mitchell.)—"Seen frequently on flooded land, Shiprock." (Gilman.)—"Reported by Indians from near Santa Fe." (Henderson.)
168. *Agelaius phoeniceus fortis*. Thick-billed Redwing.
"Common winter visitor, Silver City." (Hunn.)
169. *Agelaius phoeniceus neutralis*. San Diego Red-wing.
A great many were taken near Albuquerque, where they were plentiful, for a study of the seasonal changes, in coloration. Taken during the months of Jan., Feb., May, Sept., Oct., and Dec. One seen March 26, Galisteo; mentioned during April and May at Pecos and Willis. (Birtwell.)—Resident in vast numbers in Mesilla Valley, pests on corn and wheat. (Ford.)—"Breeds south to New Mexico." (A. O. U. Check List.)
170. *Sturnella magna hoopesi*. Rio Grande Meadowlark.
"Southern New Mexico." (A. O. U. Check List.)
171. *Sturnella neglecta*. Western meadowlark.
"A few seen in March and April and one or two in Oct., Apache." (Anthony.)—"Rather infrequent in summer, one specimen July 2, Agua azul." (Henshaw.)—"Abundant, breeds to 8000 ft., San Miguel Co." (Mitchell.)—"Common resident in winter, Silver City." (Hunn.)—"Seen a few miles north of Pecos." (Bailey, F.)—"Common in cultivated lands, Shiprock." (Gilman.)—"Reported from Santa Fe by McCall." (Henderson.)—

- "Flock of two dozen Jan. 11; others Sept. 14 and Oct. 7, Albuquerque; one seen March 26, Galisteo." (Birtwell.)
—Permanent resident, though more numerous in summer, in Mesilla Valley. (Ford.)
172. *Icterus parisorum*. Scott's Oriole.
"First seen April 26, common after May 1, specimens taken last of May, Apache." (Anthony.)—"One specimen, rare, Ft. Bayard." (Wilson.)—"Several were seen in Mts., near Santa Fe in July." (Nelson.)—"Breeding near Santa Rosa in May." (Bailey, F.)—"One specimen, Coleman Ranch, in Aug., Silver City." (Hunn.)—"East-central New Mexico." (A. O. U. Check List.)
173. *Icterus cucullatus nelsoni*. Arizona Hooded Oriole.
"Arrives April 13, common in spring, Silver City." (Hunn.)
174. *Icterus bullocki*. Bullock's Oriole.
"One specimen, May 15, Apache." (Anthony.)—"Tolerably common; breeds to 10000 ft., San Miguel Co." (Mitchell.)—"Arrives Apr. 30, common, Silver City. (Hunn.) "A few pairs nesting, Shiprock." (Gilman.)—"Seen at Mangus Springs, Aug. 14." (Metcalf.)—"Very Common resident in Mesilla Valley in summer. (Ford.)
175. *Euphagus cyanocephalus*. Brewer's Blackbird.
"Abundant in Apache and Hachita regions after Apr. 20, all summer except last of June and first of July." (Anthony.)—"Abundant throughout New Mexico." (Henshaw.)—"Fairly common, breeds from plains to 8000 ft., San Miguel Co." (Mitchell.)—"Common from Sept. 1 to May 6, Silver City." (Hunn.)—"Common around Shiprock." (Gilman.)—"Common along Rio Grande to Santa Fe." (McCall.)—"Common around Albuquerque, flocks seen Feb., May, Sept. and Oct.; seen during April and May, Willis and Pecos; specimens from Rincon in Feb." (Birtwell.)—"A resident of Mesilla Valley. (Ford.)
176. *Hesperiphona vespertina montana*. Western Evening Grosbeak.
"Rather common in spring, Silver City." (Hunn.)—"A few in southwestern New Mexico." (Stephens.)—"Very numerous fall migrant at Ft. Wingate." (Shufeldt.)—"Flock and a few pairs in Pecos Mts. Along Pecos River in July, flocks 8000 ft., and lower, Aug." (Bailey F.)—"Ft. Thorne and Burgwyn." (Ridgway.)—"Plentiful, seen in May; a flock of 12 Oct. 20, Albuquerque." (Birtwell.)—"Las Vegas in fall." (Cockerell.)

177. *Pinicola enucleator montana*. Rocky Mountain Pine Grosbeak.
 "Two specimens, Canadian and Hudsonian Zones, one family seen at head of Pecos River, Aug. 14, 12000 ft." (Bailey, F.)—Two specimens, Kingston, Nov. 12." (Metcalfe.)
178. *Carpodacus cassini*. Cassin's Purple Finch.
 "A few seen in summer and fall in Mts., east of Santa Fe. Large flocks, nine specimens, Salt Lake, south of Zuñi, Nov. 20." (Henshaw.)—"One seen, Upper Pecos, July 15." (Bailey, F.)—"A few seen May 6 and 9, Albuquerque; one specimen, Upper Pecos, July, rare, one specimen, Socorro, Jan." (Birtwell.)—"Northern New Mexico." (A. O. U. Check List.)
179. *Carpodacus mexicanus frontalis*. House Finch.
 "Common in Apache and Hachita regions from February until April 15." Anthony.)—"Great numbers were seen at Taos." (Henshaw.)—"Abundant around Las Vegas." (Mitchell.)—"Abundant resident at Silver City." (Hunn.)—"Seen at the base of the range between Pecos and Glorieta." (Bailey, F.)—"Numerous, breeds, Shiprock." (Gilman.)—"Heard continuously around Albuquerque; plentiful around Pecos, March 27; one specimen from Herrick, killed at Gallinas Springs, April 1." (Birtwell.)—"Common in Santa Fe." (Henderson.)—"A common permanent resident in Mesilla Valley. A pest on apples. (Ford.)
180. *Loxia curvirostra stricklandi*. Mexican Crossbill
 "One seen Oct. 20 in Mts. east of Santa Fe." (Henshaw.)—"A small flock seen Dec. 20, Las Vegas Hot Springs." (Batchelder.)—"Common at 11000 ft., a few 11600; Aug. 21, seen at 8000 ft., Upper Pecos." (Bailey, F.)—"Common on Jemez Mts. near Valle Grande, Aug. 20." (Henderson.)—"Mogollon Mts." (Ridgway.)
181. *Leucosticte australis*. Brown-capped Rosy Finch.
 "Two specimens, Wheeler's Peak, July 28-9." (Bailey, F.)—"Northern New Mexico." (A. O. U. Check List.)
182. *Astragalinus tristis pallidus*. Pale Goldfinch.
 "Seen a few times, not common, Shiprock." (Gilman.)
183. *Astragalinus psaltria psaltria*. Arkansas Goldfinch.
 "A few seen in Little Hachita, April 26 and 30." (Anthony.)—"One specimen, inscription Rock, Aug. 23." (Henshaw.)—"Not common, breeds to 10000 ft., San Miguel Co." (Mitchell.)—"Found at Glorieta in July." (Bailey, F.)—"Present during breeding season, not common, Shiprock." (Gilman.)—"Seen Sept. 3, a few in Oct.,

- Nov., and Dec., Albuquerque." (Birtwell.)—"One of the most abundant birds in Trijoles Canyon." (Henderson.)—Three specimens, Kingston, July 16." (Metcalfe.)
184. *Astragalinus psaltria hesperophilus*. Green-backed Goldfinch.
 "Extreme southwestern New Mexico." (A. O. U. Check List.)
185. *Astragalinus lawrencei*. Lawrence's Goldfinch.
 "East to New Mexico." (A. O. U. Check List.)
186. *Spinus pinus*. Pine Siskin.
 "Abundant in fall in Mts., east of Santa Fe." (Henshaw.)
 —"Abundant around Las Vegas Hot Springs in Dec. (Batchelder.)—"Has been seen every month except June, July and Aug. in Grant Co." (Hunn.)—"Common in Aug., seen from 7500 to 11600 ft., a family at 10400, Upper Pecos." (Bailey, F.)—"Seen along river in April, six in Mts., in July, Shiprock." (Gilman—"Plentiful in Upper Pecos in July, gregarious; abundant in Willis, Mich., Apr. and May; seen in Albuquerque, May, Nov., and Dec." (Birtwell)—"Saw flocks in Filmore Canyon, Organ Mts., in April." (Metcalfe.)—"Southern New Mexico." (A. O. U. List.) Resident in Mesilla Valley. (Ford.)
187. *Calearius ornatus*. Chesnut-collared Longspur.
 "Large flocks seen in Apache region in spring until Apr. 10, also as early as Oct. 1." (Anthony.)—"One specimen in Mts. east of Santa Fe, Sept. 12." (Henshaw.)—"Four specimens, Ft. Union, Mch. 22." (Coale.)—"Abundant in winter on plains, leave in Apr., Silver City." (Hunn.)—"Ft. Thorne and Upper Pecos." (Ridgway.)
188. *Rhynchophanes mccowni*. McCown's Longspur.
 "Observed along Southern Pacific R. R., near Apache from Oct. until Feb." (Anthony.)—"Six specimens, Ft. Bayard, Oct. 22." (Henshaw.)—"Ft. Union, Mch. 22." (Coale.)—"One specimen, others seen near Tijeras, Jan. 17; seen on mesa near Albuquerque, Jan. and Dec." (Birtwell.)
189. *Poocetes gramineus confinis*. Western Vesper Sparrow.
 "Abundant during spring migrations in lower regions of Hachita and Apache regions, rare in Oct." (Anthony.)—"One specimen, Sept. 20, Mts. east of Santa Fe." (Henshaw.)—"Common to 8000 ft., San Miguel Co." (Mitchell.)—"Seen a number of times from July 25 to Aug. 17, Upper Pecos." (Bailey, F.)—Flocks seen around Albuquerque in Sept. and Oct.; three or four

seen in Willis in May." (Birtwell.)—"Common about fields near Shiprock." (Gilman.)—"Common from Sep. to Apr., Silver City." (Hunn.)—"Boca Grande." (Ridgway.)—Specimens from Mesilla Valley in Mch. Apr. and May. (Ford.)

190. *Passerculus sandwichensis alaudinus*. Western Savannah Sparrow.

"Extends through New Mexico." (Henshaw.)—"Throughout New Mexico." (Woodhouse.)—One specimen, Albuquerque Sept. 7. (Birtwell.)—One specimen, Mesilla Park, in March. (Ford.)

191. *Ammodramus bairdi*. Baird's Sparrow.

"One specimen, Gila River, Oct. 16, two specimens, Mts. east of Santa Fe, in summer." (Henshaw.)—"One specimen twelve miles north of Las Vegas, Sept. 2; one specimen at timber line, Aug. 11. (Bailey, F.)—"One specimen, Albuquerque, Sept. 7." (Birtwell.)—"Migrates through New Mexico." (A. O. U. Check List.)

192. *Ammodramus savannarum bimaculatus*. Western Grasshopper Sparrow.

"Very common in some parts of New Mexico." (A. O. U. Check List.)

193. *Chondestes grammacus strigatus*. Western Lark Sparrow.

"Very abundant during migration, more so in spring, Apache." (Anthony.)—"Abundant from plains to 8000 ft., San Miguel Co." (Mitchell.)—"Arrives Apr. 9, common by May, Silver City." (Hunn.)—"Arrives May 1, very numerous, Shiprock." (Gilman.) "A few seen at foot of Jemez Mts., reported on plains by McCall." (Henderson.)—"A few seen in Willis in May; one specimen, Albuquerque, Apr. 14, early; San Antonio, Aug." (Birtwell.)—"Common on foothills of Mangus Springs, in Summer." (Metcalf.)—One specimen, Gila Hot Springs, Aug. (Barber.)—One specimen, Mesilla Park, April. (Ford.)

194. *Zonotrichia leucophrys leucophrys*. White-crowned Sparrow.

"Very abundant from Feb. until April, Apache." (Anthony.)—"Rare migrant in Mts. east of Santa Fe." (Henshaw.)—"Common, breeds to 11000 ft., Pecos Mts." (Bailey F.)—"Fairly common in winter and spring, Shiprock." (Gilman.)—"Abundant winter resident, leaves May 1, Silver City." (Hunn.)

195. *Zonotrichia leucophrys gambeli*. Intermediate Sparrow.
 "Common as a migrant, Mts. east of Santa Fe." (Henshaw.)—"Uncommon in summer, also fall, Ft. Bayard." (Wilson.)—"One seen Dec. 12, immature, Las Vegas Hot Springs" (Batchelder.)—"Not very numerous, Shiprock." (Gilman.)—"Seven or eight seen Sept. 30, also a few in May, Dec. and Oct.; specimens from Socorro and Pecos." (Birtwell.)—"Very common resident in Mesilla Valley. (Ford.)
196. *Spizella monticola ochracea*. Western Tree Sparrow.
 "A small flock occasionally in Dec., Las Vegas Hot Springs." (Batchelder.)—"Common in brush in winter and Spring, Shiprock." (Gilman.)—"One specimen, Albuquerque, Nov. 18 (Birtwell.)—"Winters in New Mexico." (A. O. U. Check List.)
197. *Spizella passerina arizonae*. Western Chipping Sparrow.
 "Very abundant as migrant, Apache." (Anthony.)—"Abundant summer resident in Mts. east of Santa Fe. One specimen, Ft. Wingate, two specimens, Santa Fe, one specimen, Inscription Rock, June and July." (Henshaw.)—"A few in fall, Ft. Bayard." (Wilson.)—"Abundant to 9000 ft., breeds, common at 7000 ft., San Miguel Co." (Mitchell.)—"Common at 11000 ft., breeds in July, Gorieta and Pecos Mts." (Bailey, F.)—"Seen during April and May, Pecos and Willis; very common on mesas near Albuquerque, May 6, also seen in Sept." (Birtwell.)—"Common in El Rito Canyon." (Henderson.)—"Common resident at Shiprock." (Gilman.)—"Common resident at Silver City." (Hunn.)—"Two specimens, July 10, Kingston. (Metcalf.)—"Winter and perhaps permanent resident in Mesilla Valley, specimens February and April. (Ford.)
198. *Spizella pallida*. Clay-colored Sparrow.
 "Common as migrant, Apache." (Anthony.)—"Common the last of Aug., Las Vegas." (Bailey, F.)—"A flock seen Sept. 14, Albuquerque." (Birtwell.)—"Winters from southern New Mexico south." (A. O. U. Check List.)
199. *Spizella breweri*. Brewer's Sparrow.
 "Common as migrant, Apache." (Anthony.)—"Rather abundant, Gila River, one specimen Sept. 1." (Henshaw.)—"Flocks seen last of Aug., near Las Vegas." (Bailey, F.)—"Frequently seen in spring, Shiprock." (Gilman.)—"Flocks seen Sept. 3 near Albuquerque." (Birtwell.)—"Summer resident in Mesilla Valley, breeds, specimens March and May. (Ford.)

200. *Spizella wortheni*. Worthon's Sparrow.
 "Type specimen, Silver City." (A. O. U. Check List.)
201. *Spizella atrogularis*. Black chinned Sparrow.
 "One specimen, Oct. 9, Little Hachita, one seen Nov. 24, Big Hachita." (Anthony.)—"Southern New Mexico." (A. O. U. Check List.)
202. *Junco aikeni*. White-winged Junco.
 "Casually to New Mexico." (A. O. U. Check List.)
203. *Junco hyemalis hyemalis*. Slate-colored Junco.
 "Two seen in Mch., Shiprock." (Gilman.)—One specimen, Albuquerque, Nov. 3. (Birtwell.)—"Casual in New Mexico." (A. O. U. Check List.)
204. *Junco hyemalis connectens*. Shufeldt's Junco.
 "Common winter resident, Apache." (Anthony.)—"Common summer resident in Mts. east of Santa Fe." (Henshaw.)—"Plentiful along Gila River." (Stephens.)—"Very abundant in Dec., Las Vegas Hot Springs." (Batchelder.)—"Common last of Oct., Ft. Bayard." (Wilson.)—"Type specimen, Ft. Wingate, Oct. 13." (Coale.)—"Abundant winter resident, Silver City." (Hunn.)—"Common in winter and early spring, Shiprock." (Gilman.)—"One specimen from a flock, Jan. 11, a few in Nov., flocks in Sept., rare in winter, Albuquerque." (Birtwell.)—"Winters in New Mexico." (A. O. U. Check List.)
205. *Junco hyemalis montanus*. Montana Junco.
 "Winters south of New Mexico." (A. O. U. Check List.)
206. *Junco hyemalis mearnsi*. Pink-sided Junco.
 "Common winter resident in all Mts. visited, Apache and Hachita." (Anthony.)—"Common summer resident in Mts. east of Santa Fe. One specimen, Silver City, Oct. 24, not common." (Henshaw.)—"Las Vegas Hot Springs, Dec. 6 and 22." (Batchelder.)—"Ft. Union, Mch. 22." "Specimens secured, Ft. Marcy, Mch. 25." (Coale.)—"Abundant winter resident, Silver City." (Hunn.)—"Seen in winter and spring, Shiprock." (Gilman.)—"Winters south through New Mexico." (A. O. U. List.) "One specimen, Albuquerque Nov. 3." (Birtwell.)
207. *Junco hyemalis annectens*. Ridgeway's Junco.
 "One specimen, Little Hachita, Fall." (Anthony.)—"One specimen from flock, Albuquerque, Dec. 20." (Birtwell.)
208. *Junco phaeonotus dorsalis*. Red-backed Junco.
 "Common in high Mts. July 16, a nest of three eggs." (Stephens.)—Refers to nest of eggs taken in New Mexico. (Brew.)—"Abundant, common to 8000 ft., breeds, San

- Miguel Co." (Mitchell.)—"One specimen July 13, 8000 ft., Upper Pecos." (Bailey, F.)—"Abundant from base to top of Jemez Mts." (Henderson.) "Breeds in high Mts. of New Mexico." (A. O. U. Check List.)—One specimen, Upper Pecos, July 18. (Coghill.)—One specimen, Ruidoso, Aug. (Barber.)
209. *Junco phaeonotus caniceps*. Gray-headed Junco.
 "Common winter resident in all Mts., visited, Apache and Hachita ranges." (Anthony.)—"Common summer resident in Mts. east of Santa Fe." (Henshaw.)—"Very abundant in Dec., Las Vegas Hot Springs." (Batchelder.)—"Specimens secured, Ft. Marcy, March 25." (Coale.)—"Fairly common winter visitor, Silver City." (Hunn.)—"Breeds abundantly in July, 11000 ft., Upper Pecos." (Bailey, F.)—"Seen on river in spring, breeds in Mts. in July, Shiprock." (Gilman.) "Common in Willis, March, April and May; a flock seen January 21, Tijeras." (Birtwell.)—"Breeds in Northern New Mexico." (A. O. U. Check List.)
210. *Amphispiza bilineata deserticola*. Desert Sparrow.
 "One specimen, Ft. Wingate, July 14." (Henshaw.)—"Very common summer resident, a few in winter, Silver City." (Hunn.)—"Seen June 24, Rio Concho; July 7, Santa Fe." (Bailey, F.)—"Seen along river and plains, Shiprock." (Gilman.)—Quite common along foothills of Organs, especially in summer. (Ford.)
211. *Amphispiza belli*. Bell's Sparrow.
 "San Marcial and Ft. Thorne" (Ridway.)
212. *Amphispiza nevadensis nevadensis*. Sage Sparrow.
 "Common in fall and winter, San Macial." (Goss.)—"Winters in New Mexico." (Henshaw.)—"Winter resident in small numbers, Silver City." (Hunn.)—"Seen twice near sulphur springs, Shiprock." (Gilman.)—"Winters in southern New Mexico." (A. O. U. Check List.)—One specimen, Mesilla Park, Jan. 7. (Metcalf.)
213. *Peucaea cassinii*. Cassin's Sparrow.
 "First seen July 19, common until fall, Apache." (Anthony.)—"One specimen, Upper Pecos." (Henshaw.)—"June 28, Cavra Spring, south central part of San Miguel Co." (Bailey, F.)
214. *Aimophila ruficeps scotti*. Scott's Sparrow.
 "Common from Feb. to Oct., 1886, none seen Oct. and Nov. 1889, Apache." (Anthony.)—"Southern New Mexico. One specimen, Ft. Bayard, Oct. 19." (Henshaw.) "One specimen June 25, 6000 ft., Upper Sonoran Zone, near Mesa del Agua de la Yegua." (Bailey, F.)

215. *Melospiza melodia fallax*. Desert Song Sparrow.
 "One specimen, Ft. Bayard, Oct. 19." (Henshaw.)—"A flock seen, one specimen, Albuquerque, Feb. 8." (Birtwell.)
216. *Melospiza melodia montana*. Mountain Song Sparrow.
 "A few seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Common, breed from 6000 to 9000 ft., San Miguel Co." (Mitchell.)—"Two seen, Tijeras, Mch. 21; two specimens, Albuquerque, Jan. and Feb.; one specimen, Socorro, Dec. 14." (Birtwell.)—"Scarce, just arrived, Kingston, one specimen, Nov. 1." (Metcalf.)—"Specimens, Mesilla Park, Jan. and Mch. (Ford.)—"Breeds in New Mexico." (A. O. U. Check List.)
217. *Melospiza lincolni lincolni*. Lincoln's Sparrow.
 "First seen Sept. 12, numerous in fall, Mts. east of Santa Fe." (Henshaw.)—"Fall and spring migrant, Silver City." (Hunn.)—"Breeding at 11000 ft., July, Upper Pecos." (Bailey, F.)—"A few in Feb. and Mch., Shiprock." (Gilman.)—"One specimen, Albuquerque, Oct. 9, (Birtwell.)
218. *Passerella iliaca schistacea*. Slate-colored Sparrow.
 "Winters south to New Mexico." (A. O. U. Check List.)
219. *Pipilo maculatus arcticus*. Arctic Towhee.
 "Eastern New Mexico." (Ridgway.)
220. *Pipilo maculatus montanus*. Spurred Towhee.
 "A few seen during migration, Apache." (Anthony.)—"Uncommon, one or two pairs during summer in Mts. east of Santa Fe. One Specimen, Ft. Wingate, July 16." (Henshaw.)—"Ft. Union, Mch. 22." (Coale.)—"Occurs in small numbers in Dec., Las Vegas Hot Springs." (Batchelder.)—"Abundant in New Mexico in bushy districts." (Stephens.)—"Common June 25, Mesa del Agua de la Yegua, also west of Pecos. Fairly common in foothills between Pecos and Santa Fe." (Bailey, F.)—"Young and adults seen in Chusca Mts." (Gilman.)—"A few seen in canyons and on mesas at El Rito." (Henderson.)—"One seen in Albuquerque, Sept. 19; one specimen, Pecos, April." (Birtwell—"East to New Mexico." (A. O. U. Check List.) One specimen, Kingston. Oct. 24. (Metcalf.)—A resident of Mesilla Valley, two specimens, Mesilla Park, Feb. and Mch. (Ford.)
221. *Pipilo fuscus mesoleucus*. Cañon Towhee.
 "Abundant in Apache and Hachita Mts., nests with fresh eggs June 8 and July 31." (Anthony.)—"Common in Glorieta and a little further up; rather numerous, one specimen, Santa Fe, June 20." (Henshaw.)—"Partial

to rocky localities in Gila basin." (Stephens.)—"Common, seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Common, breeds abundantly, San Miguel Co." (Mitchell.)—"Ft. Union, Mch. 22." (Coale.)—"Abundant resident, Silver City." (Hunn.)—"Common in Upper Sonoran and as high as 7200 ft., Upper Pecos." (Bailey.)—"Two specimens seen often, Tijeras; seen during Apr. and May, Pecos and Willis; Glorieta in Dec.; Albuquerque in Sept." (Birtwell.)—"Three specimens, Kingston, Aug. 9." (Metcalf.)—"Common resident in Organ Mts., a few in Mesilla Valley. (Ford.)

222. *Pipilo aberti*. Abert's Towhee.

"Sparingly found along the Gila River; in river bottom, Old Ft. West, breeds first seen Feb. 11." (Stephens.)—"Common to 9000 ft., in summer, San Miguel Co." (Mitchell.)—"Southwestern New Mexico, type specimen." (A. O. U. Check List.)

223. *Pipilo chlorura*. Green-tailed Towhee.

"Seen during migrating season, more in fall, Apache." (Anthony.)—"In Nov. thousands seen, Ft. Wingate and Santa Fe, also seen in both places in summer. One brood seen, a few during migration in Mts. east of Santa Fe." (Henshaw.)—"Seen on Gila River, early spring migration." (Stephens.)—"Common, breeds from 7000 to 9000 ft., San Miguel Co." (Mitchell.)—"Common summer resident, Silver City." (Hunn.)—"One specimen 8000 ft., July 13, Upper Pecos." (Bailey F.)—"Common at Shiprock during spring migration." (Gilman.)—"A few seen, one specimen, Pecos, Sept. 7 and 30; seen in Albuquerque in May." (Birtwell.)—"Breeds in southeastern New Mexico." (A. O. U. Check List.)—"Resident of Mesilla Valley. (Ford.)

224. *Pyrrhuloxia sinuata sinuata*. Arizona Pyrrhuloxia.

"Southern New Mexico" (A. O. U. Check List.)—"Common resident of Mesilla Valley. (Ford.)

225. *Zamelodia melanocephala*. Black-headed Grosbeak.

"A few during migration, Apache." (Anthony.)—"Numerous in New Mexico." (Henshaw.)—"Fairly common, breeds from 8000, ft. down, San Miguel Co." (Mitchell.)—"One specimen July 15, 8000 ft., Upper Pecos." (Bailey, F.)—"One pair raised brood in El Rito Canyon." (Henderson.)—"Three specimens, Willis, May; one seen, Albuquerque, May 6." (Birtwell.)—"Common, breeds, Shiprock." (Gilman.)—"Arrives May 6, Silver City." (Hunn.)—"Four specimen, Kingston, June 24." (Metcalf.)

226. *Guiraca caerulea lazula*. Western Blue Grosbeak.
"Found as far north as near Santa Fe." (Henshaw.)—"One reported Aug. 6, Upper Sonoran Zone, eight miles north of Pecos. Seen Aug. 26, July 2 and 11, between Riberia and Glorieta." (Bailey, F.)—"Three seen Aug. 16, Shiprock." (Gilman.)—"Two specimen, Albuquerque, Sept." (Birtwell.)—Reported from Silver City, Aug. 14. Comon summer resident in Mesilla Valley. (Ford.)
227. *Passerina amoena*. Lazuli Bunting.
"A few immature and females seen during migration, Apache." (Anthony.)—"Diffusion in New Mexico general. One specimen, Aug. 8, Mts. east of Santa Fe." (Henshaw.)—"One seen along river in Aug., Shiprock." (Gilman.)—"Seen Aug. 14, Mangus Springs." (Metcalf.)
228. *Passerina ciris*. Painted Bunting.
"South to southeastern New Mexico." (A. O. U. Check List.)—Summer resident, Mesilla Valley, one specimen, Mesilla Park, June. (Ford.)
229. *Spiza americana*. Dickcissel.
"Extends through New Mexico." (Henshaw.)—"Very common on the prairies in New Mexico." (Woodhouse.)
230. *Calamospiza melanocorys*. Lark Bunting.
"Few in spring, and after Aug. 1 until late Oct., thousands on plains, Apache." (Anthony.)—"One specimen, Zufli, July 25, a few seen." (Henshaw.)—"Common from Oct. to May, Silver City." (Hunn.)—"One male seen in center of county June 24; small flocks Aug. 29 and Sept. 1, Las Vegas." (Bailey, F.)—"Flock of about 30, June 2, Shiprock." (Gilman.)—Two specimens, Deming, March. (Birtwell.)—"South to northwestern New Mexico." (A. O. U. Check List.)—Always large flocks in spring and fall, Mesilla Valley. (Ford.)
231. *Piranga ludoviciana*. Western Tanager.
"Seen occasionally, young and females mostly, from July 26 to Sept. 26, Apache." (Anthony.)—"Not common, a few breeding in Mts. east of Santa Fe. One specimen, Nutria, July 19." (Henshaw.)—"Pecos Mts., breeding season, one Bernal Mesa, Aug. 27; one pair and young 8000 ft., July 16, seen at 10000 ft., Upper Pecos. (Bailey, F.)—"Two specimens, Willis, May 16 and 18, others seen; one specimen, Upper Pecos, July 12; heard Sept. 10, Albuquerque." (Birtwell.)—"A few in May; in Mts. in July, Shiprock." (Gilman.)—"Transient, Silver City." (Hunn.)—"Bad on cherries in Santa Fe." (Boyle.)—One specimen, Kingston, Aug. 8. (Metcalf.)

232. *Piranga hepatica*. Hepatic Tanager.

"One male seen Sept. 14, young and females during fall migration, Apache." (Anthony.)—"June 25, Mesa del Agua de la Yegua, Bernal Mts." (Bailey, F.) "Zuñi, Ft. Thorne, Apache." (Ridway.)—"Northeastern New Mexico." (A. O. U. Check List.)—One specimen, Kingston, June 27. (Metcalf.)

233. *piranga rubra cooperi*. Cooper's Tanager.

"Breeds from northwestern New Mexico to Mexico. Type, Los Pinos, Doña Ana Co." (A. O. U. Check List.)—"Throughout New Mexico." (Woodhouse.)—Common summer resident in Mesilla Valley, specimens May and June. (Ford.)

234. *Progne subis subis*. Purple Martin.

"Rather common in southern New Mexico." (Henshaw.)—"A few near Glorieta July 10." (Bailey, F.)—"Evidently a common summer resident in Silver City." (Hunn.)—Reported from Mesilla Valley, Mangus Springs and flying over Mogollons, 10000 ft. (Metcalf.)—One specimen, Mescalero, July. (Barber.)

235. *Petrochelidon lunifrons lunifrons*. Cliff Swallow.

"A few seen Sept. 30, Apache." (Anthony.)—"Widespread species in New Mexico." (Henshaw.)—"Abundant, occurs to 8000 ft., breeds, San Miguel Co.," (Mitchell.)—"Seen between Pecos and Glorieta, July 4." (Bailey, F.)—"Common in Apr. and May, Rowe and Pecos; many nests seen, Albuquerque, May 6 and Apr. 14." (Birtwell.)—"Common throughout New Mexico." (Woodhouse.)—"Common, breeds, Shiprock." (Gilman.)—"Common summer resident, arrives in Apr., Silver City." (Hunn.)

236. *Hirundo erythrogaster* Barn Swallow.

"Seen a few times in Apache and Deming, seen nesting in Deming, and flying south as late as Oct. 1." (Anthony.)—"Abundant in summer, breeding in June, Ft. Bayard." (Wilson.)—"Numerous at Santa Fe and from there to Ft. Wingate." (Henshaw.)—"Common summer resident, arrives in Apr., Silver City." (Hunn.)—"Frequently seen nesting around Mexican adobes in June; were seen at 7200 ft., Aug. 24, Upper Pecos." (Bailey, F.)—"A few seen in June, Shiprock." (Gilman.)—"Common Apr. and May at Rowe and Pecos; also in Albuquerque in Sep. and May." (Birtwell.)—"Common in Santa Fe." (McCall.)—"Abundant at Mangus Springs in summer." (Metcalf.)—Very numerous in summer all over Mesilla Valley. (Ford.)

237. *Iridoprocne bicolor*. Tree Swallow.
 "One seen, Albuquerque, Sept. 16." (Birtwell.)
238. *Tachycineta thalassina lepida*. Northern Violet-green Swallow.
 "Rare during migrations, Apache." (Anthony.)—"Summer resident, numerous in Mts. east of Santa Fe. Abundant in high regions; one specimen, Ft. Nutria, July 19." (Henshaw.)—"Abundant, breeds mostly at 8000 ft., San Miguel Co." (Mitchell.)—"Common migrant in spring, Silver City." (Hunn.)—"From Glorieta to 11000 ft., breeding to 10400 ft., Upper Pecos, July and Aug." (Bailey, F.) "Very numerous along river, in Mts. in July, Shiprock." (Gilman.)—"Abundant in New Mexico." (Woodhouse.)—"Seen in Albuquerque in May, commonly observed; seen during April and May in Pecos and Willis; specimens from Willis in July and from Upper Pecos in July." (Birtwell.)
239. *Riparia riparia*. Bank Swallow.
 "One seen July 26, Apache." (Anthony.)—"Common in some parts of New Mexico." (Woodhouse.)—"Nesting at Santa Fe." (McCall.)—"Commonly observed around Albuquerque, noticed particularly in April, May and Sept." (Birtwell.)
240. *Stelgidopteryx serripennis*. Rough-winged Swallow.
 "A few seen along river and in edge of piñons, Shiprock." (Gilman.)
241. *Bombicilla cedrorum*. Cedar Waxwing.
 "One seen May 27, Shiprock." (Gilman.)—"Northern New Mexico." (A. O. U. Check List.)
242. *Lanius borealis*. Northern Shrike.
 "Winters south to New Mexico." (A. O. U. Check List.)—"One specimen, Jan. 5, Albuquerque." (Birtwell.)
243. *Lanius ludovicianus excubitorides*. White-rumped Shrike.
 "Seen only as a migrant, Apache." (Anthony.)—"One seen in summer in Mts. east of Santa Fe. Seen near Albuquerque in Dec." (Henshaw.)—"Common in summer, Ft. Bayard." (Wilson.)—"Common resident, Silver City." (Hunn.)—"One on nest, June 20, Rio Concha; Sept. 1 Las Vegas." (Bailey, F.)—"Seen occasionally along river, Shiprock." (Gilman.)—"Often seen around Albuquerque; one seen March 26, Galisteo." (Birtwell.)—"Permanent resident, Mesilla Valley. (Ford.)
244. *Vireosylva gilva swainsoni*. Western Warbling Vireo.
 "Found breeding in Pecos Mts. Glorieta July 7, breeding, seen as high 10300 ft., Upper Pecos." (Bailey, F.)—

- "Numerous as summer resident in Mts. east of Santa Fe." (Henshaw.)—"Arrives May 4, Silver City." (Hunn.)—"Seen occasionally and heard often along river, Shiprock." (Gilman.)—One specimen, Upper Pecos, July. (Coghill.)—"Seen in Albuquerque, Sept. 10; in Willis, May, June and July." (Birtwell.)—One specimen, Forks of Ruidoso, Aug. (Barber.)—"South to New Mexico." (A. O. U. Check List.)
245. *Lanivireo solitarius cassini*. Cassin's Vireo.
 "Rather common during fall migration, Apache." (Anthony.)—"Numerous in fall in Mts. east of Santa Fe." (Henshaw.)—"Migrates through New Mexico." (A. O. U. Check List.)
246. *Lanivireo solitarius plumbeus*. Plumbeus Vireo.
 "Fall migrant, seen as late as Sept. 25, Apache." (Anthony.)—"Rather common in summer in Mts. east of Santa Fe. Numerous in New Mexico, one specimen, Nutria, July 19." (Henshaw.)—"Common in Mts. to 9000 ft., San Miguel Co." (Mitchell.)—"Found near Glorieta only." (Bailey, F.)—"Seen several times along river and in Mts., Shiprock." (Gilman.)—One specimen, Willis, June. (Birtwell.)
247. *Vireo huttoni stephensi*. Stephen's Vireo.
 "Fairly common, breeds to 8000 ft., San Miguel Co." (Mitchell.)—"New Mexico, especially in Mt. ranges." (Coues.)
248. *Vireo belli pusillus*. Least Vireo.
 "Common on Gila River." (Stephens.)
249. *Vireo vincinior*. Gray Vireo.
 "Rare, a few taken during spring and summer, Apache." (Anthony.)—"Rare along Gila in scrub oaks." (Stephens.)—"One specimen, Colorado Chiquito, July 8." (Henshaw.)—"Abundant breeding in June, Montoya." (Bailey F.)
250. *Vermivora luciae*. Lucy's Warbler.
 "One specimen along river, May 19, Shiprock." (Gilman.)
251. *Vermivora virginiae*. Virginia's Warbler.
 "One specimen, Aug. 23, Apache." (Anthony.)—"One specimen, Tierra Amarilla, Sept. 15." (Henshaw.)—"One specimen July 10, near Glorieta, edge of Transition Zone." (Bailey, F.)—"Common as migrant, Apr., Silver City." (Hunn.)—"One specimen, Albuquerque, Sept. 16." (Birtwell.)—"One specimen, Mesilla, Apr. 25. (Ford.)"—"Breeds south to northeastern New Mexico. Type specimen, Ft. Burgwyn." (A. O. U. Check List.)

252. *Vermivora rubricapilla gutturalis*. Calaveras Warbler.
 "One specimen, College, Oct. 9, another seen Oct. 15 (Merrill.)"
253. *Vermivora celata celata*. Orange-Crowned Warbler.
 "Rare migrant, Apache." (Anthony.)—"Common during breeding season, more so in fall in Mts. east of Santa Fe. One specimen, Lake Piedra, Sept. 11." (Henshaw.)—"Common migrant, Apr. and May, Silver City." (Hunn.)—"Taken about 8000 ft., on Pecos, July 16." (Bailey, F.)—"One specimen. Oct. 7. (Birtwell.)"—
 "High Mts. on New Mexico." (Ridgway.)—"South locally in Rocky Mts. to New Mexico." (A. O. U. Check List.)
254. *Vermivora celata lutescent*. Lutescent Warbler.
 "Taken at 8000 ft., Upper Pecos, Aug. 19." (Bailey, F.)
255. *Peucedramus olivaceus*. Olive Warbler.
 "One seen, Willis, May 15." (Birtwell.)—"Mts. of southern New Mexico." (A. O. U. Check List.)
256. *Dendroica aestiva aestiva*. Yellow Warbler.
 "Seen in fall, females only, Apache." (Anthony.)—"Common in New Mexico. Very scarce in summer in Mts. east of Santa Fe." (Henshaw.)—"Fairly common in summer in settlements, not in Mts., San Miguel Co." (Mitchell.)—"Very common, breeds, Shiprock." (Gilman.)—"One specimen, Albuquerque, Oct. 5. (Birtwell.)"—
 "South to northern New Mexico." (A. O. U. Check List.)
257. *Dendroica aestiva sonorana*. Sonora Yellow Warbler.
 "Common after Apr. 30, Silver City." (Hunn.)—"Los Pinos." (Ridgway.)—"Breeds, Lower Austral Zone on New Mexico," (A. O. U. Check List.)
258. *Dendroica caerulescens caerulescens*. Black-throated Blue Warbler.
 "One specimen, Gallinas Mts., Rio Arriba Co., Oct. 8." (Bailey, F.)
259. *Dendroica auduboni auduboni*. Audubon's Warbler.
 "Common migrant, Apache and Hachita regions." (Anthony.)—"Abundant in summer, breeds, Mts. east of Santa Fe. Two specimens, Gila River, Oct. 11." (Henshaw.)—"Abundant migrant, Silver City." (Hunn.)—"At 7000 to 11000 ft. Aug. 11, Upper Pecos." (Bailey, F.)—"Numerous in May, Mts. in July, Shiprock." (Gilman.)—"Two specimens, Upper Pecos, July. (Coghill.)—"Seen during April and May, Willis and Pecos; trees swarming Sept. 10, mostly gone by Oct. 14, Albuquerque." (Birtwell.)—"Common at foot of Jemez Mts., Aug. 2." (Henderson.) "Rio de las Casas." (Atkins.)

- "Abundant throughout New Mexico," (Woodhouse.)
 "A few in Mesilla Valley all the year, numerous in spring and fall. (Ford.)
260. *Dendroica cerulea*. Cerulean Warbler.
 "Rio Mimbres." (Henry.)—"Straggles to New Mexico."
 (A. O. U. Check List.)
261. *Dendroica striata*. Black-poll Warbler.
 "Casual in New Mexico." (A. O. U. Check List.)
262. *Dendroica graciae*. Grace's Warbler.
 "Fall migrant, Mts. east of Santa Fe. One specimen, Inscription Rock, July 24." (Henshaw.)—"Rare, found nest June 12, 8500 ft., San Miguel Co." (Mitchell.) "One seen, Albuquerque, Oct. 7." (Birtwell.)—"Mts. of New Mexico." (A. O. U. Check List.)
263. *Dendroica nigrescens*. Black-throated Gray Warbler.
 "One seen in spring, not uncommon in fall, Apache." (Anthony.)—"One specimen, Santa Fe, Aug. 16." (Henshaw.)—"Common migrant, April and May, Silver City." (Hunn.)—"One specimen, three miles south of Pecos, July 3." (Bailey, F.) "Fairly common among pines and oaks in Mts., breed in Mts. and on river, Shiprock." (Gilman.)—"Northern New Mexico." (A. O. U. Check List.)—One specimen, Kingston, Aug. 23. (Metcalf)
264. *Dendroica townsendi*. Townsend's Warbler.
 "Specimens taken Apr. 23 and Aug. 2, Apache and Hachita, Sept. 28." (Anthony.)—"Common fall migrant in Mts. east of Santa Fe." (Henshaw.)—"One specimen, Ft. Bayard, May." (Stephens.)
265. *Seiurus noveboracensis. notabilis*. Grinnell's Water-Thrush.
 "Two specimens, Coleman Ranch, Silver City, May 6." (Hunn.)—"One specimen along river, Shiprock." (Gilman.)
266. *Oporonis tolmiei*. Macgillivray's Warbler.
 "Very abundant, especially from Aug. 3 to Oct 12, Apache." (Anthony.)—"Seen at many different points in New Mexico. Common fall migrant, Mts. east of Santa Fe." (Henshaw.)—"Taken in Pecos Mts., 8000 ft., July 15." (Bailey, F.)—"Numerous in May along river, seen in Chusca Mts. in July, Shiprock." (Gilman.)—"South to New Mexico." (A. O. U. Check List.)—One specimen, Mesilla, Apr. 27. (Ford.)
267. *Geothlypis trichas occidentalis*. Western Yellow-throat.
 "Two specimens, Apr. 30 and May 31, Little Hachita." (Anthony.)—"Common migrant, Apr. and May, Silver

- City." (Hunn.)—"Common all through May, Shiprock." (Gilman.)—"Commonly seen, one specimen, Sept. 10, Albuquerque." (Birtwell.)
268. *Icteria virens longicauda*. Long-tailed Chat.
 "One seen Sept. 15, near Apache." (Anthony.)—"Met in many different localities in New Mexico." (Henshaw.)
 "Seen June 30 and July 2, Pecos, from La Cuesta to Riberia." (Bailey, F.)—"Abundant in some parts of New Mexico." (Woodhouse.)—"Several pairs seen along river, Shiprock." (Gilman.)
269. *Wilsonia pusilla pusilla*. Wilson's Warbler.
 "Very abundant as a migrant, Apache." (Anthony.)—"Numerous as a fall migrant in Mts. east of Santa Fe." (Henshaw.)—"Flock seen Sep. 13, Albuquerque." (Birtwell.)—"A few in winter in Mesilla Valley. (Ford.)
270. *Wilsonia pusilla pileolata*. Pileolated Warbler.
 "Abundant migrant in Apr. and May, Silver City." (Hunn.)—"Breeding July 23 11000 ft., Upper Pecos." (Bailey, F.)—"Seen frequently in May, Shiprock." (Gilman.)—"South to Mts. of New Mexico." (A. O. U. Check List.)—"One specimen, Kingston, Aug. 24." (Metcalf.)—"One specimen, Albuquerque, Sep. 15. (Birtwell.)
271. *Setophagas ruticilla*. Redstart.
 "A pair seen May 27, Shiprock." (Gilman.)—"One specimen, Kingston, Aug. 24. (Metcalf.)
272. *Setophaga picta*. Painted Redstart.
 "One specimen, Aug. 31, Apache." (Anthony.)—"One specimen, Ft. Union." (Henshaw.)—"Mts. of southern New Mexico." (A. O. U. Check List.)
273. *Cardellina rubrifrons*. Red-faced Warbler.
 "One specimen, young, Ft. Bayard, July 16." (Brewster.)—"Mts. of southwestern New Mexico." (A. O. U. Check List.)
274. *Anthus rubescens*. Pipit.
 "A few seen in Oct. on plains near Apache." (Anthony.)—"The one Alpine bird, Trucas 13250 ft., breeding, Upper Pecos, July." (Bailey, F.)—"Seen during spring migration, Shiprock." (Gilman.)—"Specimens Oct. 9 and Dec. 28, Albuquerque." (Birtwell.)—"High Mts. south to New Mexico." (A. O. U. Check List.)—"Two specimens, Mesilla Park. (Ford.)
275. *Cinclus mexicanus unicolor*. Dipper.
 "Numerous summer resident along Upper Pecos. Two specimens, Diamond Creek, Nov. 11." (Henshaw.)—"At least 30 seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Abundant, breeds 8000 ft. and up, San

Miguel Co." (Mitchell.) "From 7200 to 8000 ft., July and Aug., Upper Pecos." (Bailey, F.)—"Fairly common, one specimen, Upper Pecos, Aug.; seen March and April, Willis and Pecos, common." (Birtwell.)—"Found twelve miles west of Santa Fe." (Henderson.)—Found in Mogollon and Organ Mts. (Ford.)—"South to southern New Mexico." (A. O. U. Check List.)

276. *Oreoscoptes montanus*. Sage Thrasher.

"Abundant from February 28 to March 31, then after Sept. 1, Apache." (Anthony.) "Navajo Creek, Sept. 11; Ft. Wingate, July 14." (Henshaw.)—"Rather common migrant, a few in winter, Silver City." (Hunn.)—"Two seen Aug. 27 near Ribera. (Bailey, F.)—"Three seen on plains, Shiprock." (Gilman.)—"One specimen Sep. 10, flocks seen Sept. 20, Albuquerque." (Birtwell.)—"Zuñi Mts." (Woodhouse.)—"South to northern New Mexico." (A. O. U. Check List.)—One specimen, Mesilla Park, Jan. 19. (Ford.)

277. *Mimus polyglottos leucoptera*. Western Mocking-bird.

"Lower Sonoran Zone, south central part of San Miguel Co., nest June 26, along Concha." (Bailey, F.)—"Common summer resident, Silver City." (Hunn.)—"Southwest New Mexico, along Gila." (Stephens.)—"Numerous near river, Shiprock." (Gilman.)—"Reported at Santa Fe." (Henderson.)—Seen in Mogollon Mts., as high as 10000 ft.; common around Mangus Spring in Summer." (Metcalf.)—Very common in Mesilla Valley in summer, a few all the year. (Ford.)

278. *Dumetella carolinensis*. Catbird.

"Two specimens, Rinconada, June 4: common on Pueblo Creek in July." (Bailey, F.)—"One seen in May, Shiprock." (Gilman.)—"South to northeastern New Mexico." (A. O. U. Check List.)

279. *Toxostoma curvirostre curvirostre*. Curve billed Thrasher.

"Abundant in summer, breeds, Ft. Bayard." (Wilson.)—"Abundant summer resident, a few in winter, Silver City." (Hunn.)—"South central New Mexico." (A. O. U. Check List.)

280. *Toxostoma curvirostre palmeri* Palmer's Thrasher.

"Several pairs seen during spring migration, Apache; seen in Oct. and Nov., Hachita." (Anthony.)

281. *Toxostoma crissale*. Crissal Thrasher.

"Several pairs seen during spring migration, Apache; seen in Oct. and Nov., Hachita. Common throughout season, Deming." (Anthony.) "On Gila River, not common." (Stephens.)—"Rare in summer, more in fall, Ft. Bayard." (Wilson.)—"Type Ft. Thorne, New Mex-

- ico." (A. O. U. Check List.)—Common summer resident, a few all the year, Mesilla Valley. (Ford.)
282. *Heleodytes brunneicapillus*. Cactus Wren.
 "Common throughout Apache and Hachita regions, nests in Yuccas and Mesquites." (Anthony.)—"Very abundant in southwestern New Mexico." (Henshaw.)—"Common resident, less so in winter, Silver City." (Hunn.)—"Southern New Mexico." (A. O. U. Check List.)—One of the most common summer birds in Mesilla Valley. (Ford.)
283. *Salpinctes obsoletus obsoletus*. Rock Wren.
 "Abundant in Apache and Hachita Mt. ranges and to a large extent resident." (Anthony.)—"Two specimens, Dec. 22, Las Vegas Hot Springs." (Batchelder.)—"Common, especially in southern part; one specimen, Santa Fe, June 17; one specimen, Tierra Amarilla, Sept. 15." (Henshaw.)—"Common, breeds from 8000 ft. down, San Miguel Co." (Mitchell.)—"Resident, Silver City." (Hunn.)—"Common in low parts, breeding, but few in high Mts." (Bailey, F.)—"Found everywhere, Shiprock." (Gilman.)—"One taken at the north of El Rito Canyon." (Henderson.)—One specimen, Organ Mts. April 19, common there in summer; one specimen, Mesilla, April. (Ford.)
284. *Catherpes mexicanus conspersus*. Cañon Wren.
 "A few seen on Hachita ranges in October and November." (Anthony.)—"Seen occasionally in Dec., Las Vegas Hot Springs." (Batchelder.)—"One specimen in Mts., near Gila River, Nov. 5." (Henshaw.)—"Fairly common, breeds to 8000 ft., San Miguel Co." (Mitchell.)—"A few in winter, Silver City." (Hunn.)—"Found throughout New Mexico." (Coues.)—"One specimen, Socorro, Jan. 12. (Birtwell.) Two specimens, Kingston, Aug. 9. (Metcalf.)—Seen on lava flow, near Mesquite station, March 15. (Ford.)
285. *Thryomanes bewicki bairdi*. Baird's Wren.
 "Common in Apache and Hachita during migration." (Anthony.)—"One specimen Big Hatchet Mts., Grant Co., May 9." (Allen.)—"Common, usually breeds below 8000 ft., San Miguel Co." (Mitchell.)—"Specimens January and May, Silver City." (Hunn.)—"Noted February and March and in July, Shiprock." (Gilman.)—One specimen, Albuquerque, May 6. (Birtwell.)—One specimen, Kingston, Aug. 6. (Metcalf.)
286. *Troglodytes aedon parkmani* Western House Wren.
 "Rare but seen during both migrations, Apache." (Anthony.)—"Abundant to 10000 ft., two broods, San Mi-

- guel Co." (Mitchell.)—"Arrives in April, common then, Silver City." (Hunn.)—"July 10, nest, Glorieta; seen July 14, 8000 ft.. seen Aug. 9, 11600 ft., Upper Pecos." (Bailey, F.)—"Several found among pines, Shiprock." (Gilman.)—"Seen often in Apr. and May, Pecos and Willis; one specimen, Albuquerque, Apr. 6." (Birtwell.)—"Common in canyons and on mesas near Santa Fe." (Henderson.)—One specimen, Sawyer's Peak, above Kingston, Aug. 11. (Metcalf.)
287. *Nannus hyemalis pacificus* Western Winter Wren.
"South to southern New Mexico." (A. O. U. Check List.)
288. *Telmatodytes palustris paludicola*. Tule Wren.
"Rather common, one specimen, Lake Piedra, Sept. 13." (Henshaw.)
289. *Telmatodytes palustris plesius*. Western Marsh Wren.
"Breeds to New Mexico. Type specimen, Ft. Wingate." (A. O. U. Check List.)—"Dozens seen Apr. 14, one specimen, Apr. 6, Albuquerque." (Birtwell.)
290. *Certhia familiaris montana*. Rocky Mountain Creeper.
"Seen occasionally in Dec., Las Vegas Hot Springs." (Batchelder.)—"Fairly common to 10000 ft., breeds, San Miguel Co." (Mitchell.)—"Casually met in Pinos Altos country." (Hunn.)—"Young were seen 11600 ft., Aug. 14 and 16, Upper Pecos." (Bailey, F.)—"Near top of Chusca Mts., young seen in July, Navajo Reservation." (Gilman.)—"Generally distributed in New Mexico." (Woodhouse.)—"South in Mts. to New Mexico." (A. O. U. Check List.)—"Two seen, one specimen, Willis, Mch. 28." (Birtwell.)—"One specimen, Sawyer's Peak above Kingston, Aug. 11. (Metcalf.)—Two specimens in river near Mesilla, Mar. 3. (Ford.)
291. *Sitta carolinensis aculeata*, Slender-billed Nuthatch.
"Abundant summer resident in Mts. east of Santa Fe." (Henshaw.)—"Seen at 8000 ft. in New Mexico." (Brew.) "A few seen in Dec., Las Vegas Hot Springs." (Batchelder.)—"Abundant, breeds from 7000 to 8000 ft., San Miguel Co." (Mitchell.)—"Abundant from Pinos Altos north." (Hunn.)—"Numerous in Mts. in July, one in valley, June 29, Shiprock." (Gilman.)—"Rio de la Casas, July 27-8." (Atkins.)—"A few seen in Willis, April 18; two seen on mesas near Albuquerque Dec. 21." (Birtwell.)—"Two specimens, Organ Mts., April 19, always to be seen there in summer. (Ford.)
292. *Sitta carolineus nelsoni*. Rocky Mountain Nuthatch.
"Taken at Glorieta, also on plains." (Bailey, F.)—"Common on mesas and in Mts. near Santa Fe." (Henderson.)
--"Usually saw one or two specimens among the pygmies

around Las Vegas Hot Springs." (Batchelder.)—"Seen in Gilmore Canyon, Organ Mts., April 19. Two specimens, Kingston, Aug. 7." (Metcalf.)

293. *Sitta canadensis*. Red-breasted Nuthatch.

"One seen near river, May 11, Shiprock."—(Gilman.)—"South in Mts. to New Mexico." (A. O. U. Check List.)

294. *Sitta pyrrhaea*. Pygmy Nuthatch.

"Extremely abundant in summer in Mts. east of Santa Fe." (Henshaw.)—"Common in December, Las Vegas Hot Springs." (Batchelder.)—"Abundant resident, breeds to 9000 ft., San Miguel Co." (Mitchell.)—"Abundant at Pinos Altos." (Hunn.)—"During July and August throughout Transition Zone, 7400 to 9800 ft., Upper Pecos." (Bailey, F.)—"Numerous in Mts., Navajo Reservation." (Gilman.) "Two specimens, Upper Pecos, 8000 ft., July." (Coghill.)—"Flocks seen Feb. 20, Tijeras; seen often in March, April and May, breeds, Willis." (Birtwell.) "Abundant in canyons, on mesas and in Mts. near Santa Fe." (Henderson.)—"Eastern New Mexico." (A. O. U. Check List.)—"Three specimens, Kingston, Oct. 27, one specimen, 10000 ft., Aug. 11. Numerous." (Metcalf.)

295. *Baeolophus inornatus griseus*. Gray Titmouse.

"Fairly common in summer, Ft. Bayard." (Wilson.)—"Resident in New Mexico." (Henshaw.)—"Common resident, Silver City." (Hunn.)—"Found in Glorieta region, common in juniper and piñon pines, Upper Sonoran Zone." (Bailey, F.)—"Very numerous in piñons and junipers, breeds in Mts., Navajo Reservation." (Gilman.)—"Two specimens, San Pedro, March 24; rather common in Tijeras in Jan., Dec. and March; five or six seen near Albuquerque, Sept. 20, also seen Nov. 29." (Birtwell.)—"Very common in junipers and cedars on mesas near Santa Fe." (Henderson.)—"Southwestern New Mexico." (A. O. U. Check List.)—"Two specimens, Kingston, Nov. 12." (Metcalf.)

296. *Baeolophus wollweberi*. Bridled Titmouse.

"Generally distributed in southern New Mexico." (Henshaw.)—"Rare north of Pinos Altos." (Hunn.)—"Mountains of Southern New Mexico." (A. O. U. Check List.)

297. *Penthestes atricapillus septentrionalis*. Long-tailed Chickadee.

"Numerous summer resident in Mts. east of Santa Fe." (Henshaw.)—"Found in Pecos Mts.; family of 9, Aug. 17, 8000 ft., one 10500 ft., Upper Pecos." (Bailey, F.)

- "Two seen Apr. 27, Pecos." (Birtwell.)—"South to northern New Mexico." (A. O. U. Check List.)
298. *Penthestes gambeli gambeli*. Mountain Chickadee.
 "Numerous summer resident in Mts. east of Santa Fe." (Henshaw.)—"Several frequently seen, Las Vegas Hot Springs, Dec." (Batchelder.)—"Common, breeds May and June, 9000 ft. and up, San Miguel Co." (Mitchell.)—"Abundant at Pinos Altos, casual at Coleman Ranch, near Silver City." (Hunn.)—"Common at Glorieta, also in Canadian and Hudsonian Zones, Upper Pecos." (Bailey, F.)—"Common in Mts., a few on river in spring, Navajo Reservation." (Gilman.)—"Very abundant in canyons, on mesas and in Mts. near Santa Fe." (Henderson.)—"One specimen, Rio de la Casa, July 23; one specimen, Sepello River, July 22." (Atkins.)—"Mts. of New Mexico. Type specimen about one day's journey west of Santa Fe." (A. O. U. Check List.)—"A few seen near Albuquerque, Oct. 14; a few seen Mch 19, Tijeras; plentiful in Willis in May." (Birtwell.)
299. *Psaltiriparus plumbeus*. Lead-colored Bushtit.
 "Common, flock in pines and firs, Ft. Bayard." (Wilson.)—"One specimen, Ft. Wingate, July 16; two specimens, July 20." (Henshaw.)—"Abundant around Silver City in fall, winter and spring." (Hunn.)—"Glorieta foothill Pecos canyon, fairly common in junipers, 6500 ft. Mesa del Agua de la Yegua." (Bailey, F.)—"Two in Feb. on river; numerous, breeding in Mts. Navajo Reservation." (Gilman.)—"One specimen, Tijeras, Mch. 16, one specimen, Albuquerque, Dec. 2." (Birtwell.)—"Two specimens, Kingston, July 9. (Metcalf.)
300. *Psaltiriparus melanotis lloydi*. Lloyd's Bushtit.
 "Mountains of Southern New Mexico." (A. O. U. Check List.)
301. *Auriparus flaviceps flaviceps*. Verdin.
 "Well distributed throughout region but not common, Apache." (Anthony.)—"A few found in winter along Gila River; June 2, nest with four birds; June 16, nest with three eggs." (Stephens.)—"Southeastern New Mexico." (A. O. U. Check List.)—"Common in summer in Mesilla Valley but not numerous, the large nest is usually found in Mesquite bushes. (Ford.)
302. *Regulus satrapa satrapa*. Golden-crowned Kinglet.
 "Young taken July 31, Pecos Baldy." (Bailey, F.)—"Common in New Mexico." (Woodhouse.)—"South to northern New Mexico." (A. O. U. Check List.)
303. *Regulus calendula calendula*; Ruby-crowned Kinglet.
 "Rather abundant in Apache Mts. during migration." (An-

thony):—"Nested in high Mts., abundant in fall, east of Santa Fe." (Henshaw.)—"Abundant migrant, seen also in winter, Silver City." (Hunn.)—"July 21, 11000 ft., breeding, Upper Pecos." (Bailey, F.)—"Common spring migrant, Shiprock." (Gilman.)—"Las Vegas Hot Springs; Dec. 18." (Batchelder.)—"Very abundant in New Mexico." (Woodhouse.)—"South in Mts. to central New Mexico." (A. O. U. Check List.)—"Two specimens, Kingston, Oct. 24, just same, plentiful." (Metcalf.)—"Seen in Apr. in Willis, in Albuquerque, Oct. 7." (Birtwell.)—"Rather a common winter resident in Mesilla, a few in summer. (Ford.)

304. *Polioptila caerulea obscura*. Western Gnatcatcher.

"First seen Apr. 1, many throughout season, several broods noted, Apache." (Anthony.)—"One specimen Agua Azul, July 2, generally distributed." (Henshaw.)—"Casual, Coleman's Ranch, near Silver City, April and May." (Hunn.)—"Several pairs, one nest, June 16, also July 28, Shiprock." (Gilman.)—"Seen in Kingston in summer, one specimen." (Metcalf.)—"Rather a common resident in the Organ Mts. (Ford.)

305. *Polioptila plumbea*. Plumbeous Gnatcatcher.

"A pair seen, male secured, April 4, Apache." (Anthony.)—"West cen. ral New Mexico." (A. O. U. Check List.)

306. *Myadestes townsendi*. Townsend's Solitaire.

"Seen at Hachita on one or two occasions in October and November, on plains near Apache. April 3." (Anthony.)—"Numerous summer resident, breeds, Mts. east of Santa Fe." Common in western New Mexico, one specimen Ft. Wingate, July 8, three specimens, Silver City, Oct. 24." (Henshaw.)—"Several seen Ft. Marcy, March 25." (Coale.)—"Seen and heard several times in Dec., Las Vegas Hot Springs." (Batchelder.)—"Rare, found nest 10000 ft., June 7, San Miguel Co." (Mitchell.)—"Rather rare in Pinos Altos country." (Hunn.)—"Pair July 15, 8000 ft., one specimen July 28, 11000 ft., nest 12000 ft., Upper Pecos." (Bailey, F.)—"Several pairs in Mts. in July, Shiprock." (Gilman.)—"Common in canyons five miles south of El Rito." (Henderson.)—"Through Rocky Mountains to New Mexico." A. O. U. Check List.)—"Common in Willis in March; common around Albuquerque; specimens from Tijeras in February and March." (Birtwell.)—"One specimen, 8000 ft., July, Upper Pecos. (Coghill.)—One specimen, Kingston, Oct. 26. (Metcalf.)

307. *Hylocichla fuscescens salicicola*. Willow Thrush.

"One pair raised a brood at El El Rito in 1910." (Hender-

- son.)---"Northern New Mexico." (A. O. U. Check List.)
 ---One specimen, Upper Pecos. (Coghill.)
308. *Hylocichla ustulata swainsoni*. Olive-backed Thrush.
 "First seen Sept. 13, numerous in Mts. east of Santa Fe."
 (Henshaw.)
309. *Hylocichla guttata guttata*. Alaska Hermit Thrush.
 "A few during migrations, Apache." [Anthony.]---"Common
 throughout New Mexico." [Woodhouse.]---"One speci-
 men, Oct. 12, fall only, rare, Mts. east of Santa Fe."
 [Henshaw.]---"In migration east to New Mexico." [A.
 O. U. Check List.]
310. *Hylocichla guttata auduboni*. Audubon's Hermit Thrush.
 "A few during migrations, Apache." (Anthony.)---"Nu-
 merous summer resident, breeds, Mts. east of Santa Fe."
 (Henshaw.)---"Arrives about May 6, Silver City." (Hunn.)
 ---"Abundant, breeding July and Aug., Upper Pecos."
 (Bailey, F.)---"High Mts. July, evidently breeding,
 Shiprock."---(Gilman.)---"South to New Mexico." (A.
 O. U. Check List.)---One specimen, Upper Pecos, July
 20." (Coghill.)---One specimen, Willis, June 3, (Birt-
 well.)
311. *Hylocichla guttata nanus*. Dwarf Hermit Thrush.
 "Along Gila to its sources as late as Nov. 8." (Henshaw.)
 ---"One specimen, Shiprock, May 12." (Gilman.)---"Win-
 ters south to New Mexico." (A. O. U. Check List.)
312. *Planesticus migratorious propinquus*. Western Robin.
 "A few the first of Apr., again Aug. 7, Apache. Rare at
 Hachita in Oct." (Anthony.)---"Common in fall in Mts.
 east of Santa Fe. Rather common, 27 specimens, Ft.
 Wingate, July 12." (Henshaw.)---"Winters abundantly
 in southern New Mexico, along river basin, a few in Mts.
 in summer." (Stephens.)---"Common, arrives in Feb.,
 common to 10000 ft., breeds Apr. May and June, San
 Miguel Co." (Mitchell.)---"Common migrant in Silver
 City, in Apr.; breeds in Mts., Pinos Altos." (Hunn.)---
 "From Pecos to Pecos Baldy, 8000 ft., July, breeding,
 nest 11000 ft." (Bailey, F.)---"One Mch. 10, several
 young, Mts., July, also along river, Shiprock." (Gil-
 man.)---"Common and breeding, Mogollon Mts. and
 Mangus Springs." (Metcalf.)---"Common in canyons
 and Mts." (Henderson.)---"A few near Albuquerque,
 Sept. and Oct.; three specimens in Jan., Tijeras, seen in
 Mch.; one specimen, Willis, Apr., common." (Birt-
 well.)---One specimen, Forks of Ruidoso, Aug. (Barber.)
 One specimen, Kingston, young, July 10. (Metcalf.)---
 Seen occasionally in autumn and winter, Mesilla Valley,
 two specimens. (Ford.)

313. *Sialia mexicana bairdi*. Chestnut-backed Bluebird.

"Abundant during migrations, Apache." (Anthony.)—
 Numerous summer resident in Mts. east of Santa Fe.
 Two specimens, Inscription Rock, July 23; two specimens,
 Gila River, Oct. 28." (Henshaw.)—"Abundant in winter on
 Gila River, a few in high Mts. all summer." (Stephens.)—
 "Fairly common to 12000 ft., breeds 10000 ft., San Miguel Co."
 (Mitchell.)—"Common migrant and winter resident, Silver City."
 (Hunn.)—"July 10, nest Glorieta. Seen as high as 10400 ft."
 (Bailey, F.)—"A few in March on river, several in Mts., Shiprock."
 (Gilman.)—"Abundant on mesas but not in canyons, near Santa Fe."
 (Henderson.)—"Flocks seen Jan. 22 and in March, Tijerhas;
 seen Oct. 4 and Dec. 4, Albuquerque; common, two specimens,
 Upper Pecos, July; breeding in Willis in March." (Birtwell.) Two specimens,
 Mesilla Park, Jan.; two specimens, Kingston, Oct. 27, breeds."
 (Metcalf.)---Common in winter in Mesilla Valley. (Ford.)

314. *Sialia currucoides*. Mountain Bluebird.

"Abundant during migrations, Apache." (Anthony.)---
 "Scare in winter, Gila River, low valleys." [Stephens.]
 ---"One specimen, Las Vegas Hot Springs, Dec. 22." (Batchelder.)---
 "Two specimens, Salt Lake, Nov. 19. four specimens, Santa Fe,
 June 17-20." (Henshaw.)---"Ft. Union, March 22." (Coale.)---
 Common, arrives in Feb., breeds to 9000 ft., San Miguel Co." (Mitchell.)
 ---"Common resident, Silver City." (Hunn.)---"Common, Glorieta,
 July 8, nest 10300 ft.; July 25, family 11000 ft." (Bailey, F.)---
 "Six seen in piñons, not high, Shiprock." (Gilman.)---
 "Common about Santa Fe." (Woodhouse.)---"Common and breeding,
 Mogollon Mts." (Metcalf.)---"Seen in Albuquerque, March, Oct. and Dec.
 and Feb.; flocks seen in Tijerhas in March; seen during April and May,
 Pecos and Willis; flocks seen Dec. 23, Lamy." (Birtwell.)---
 "South to Mts. of New Mexico." (A. O. U. Check List.)---
 Common winter resident all over the Mesilla Valley. (Ford.)

DIVISION OF MINERALOGY

REPORT OF PROGRESS

The work of this division naturally divides itself into two distinct branches as follows:

1. The compilation of statistics which will show the total and annual production of all mineral resources of the state and their value.

2. A study of the ore deposits in the various mining districts of the state and the development of the mineral resources of areas hitherto undeveloped or altogether unknown.

The compilation of statistics has already begun though at present not sufficient to deem it advisable to publish. I may say that it is gratifying indeed to note the interest and assistance rendered in this matter by mine operators and superintendents.

The field work and data on the deposits of lead and zinc are progressing favorably, most of the work at present being confined to the Magdalena district. It is hoped that detail data upon this district will be ready for publication by the time of the next report as well as a general report upon the lead and zinc of the state.

The work on the coal resource of the state is to be begun in the immediate future, to be followed by copper, iron, gold and silver, etc., as rapidly as time will permit.

Professor G. E. ANDERSON,
Chief of Division of Mineralogy.
Socorro, New Mexico.

**A CONTRIBUTION TO THE STUDY OF THE
ECOLOGICAL DISTRIBUTION OF THE ANIMAL
LIFE OF NORTH CENTRAL NEW MEX-
ICO WITH ESPECIAL ATTENTION
TO THE INSECTS.**

The animal life of this region is very interesting as it is the meeting place of two very different faunas, that of the arid south-west (Sonoran Zone of Merriam and others) with that of the more humid north and east (Canadian and Transition Zones). The latter is with us found chiefly in the mountains while the former occupies the valleys and plains or "mesas."

It is, furthermore, a most excellent place for such a study because of the fact that, except in the irrigated valleys, it has not been very seriously interfered with by the activities of man. It is evident from the last statement that now is the time for such a study, before the advance of development shall render it more difficult. As to the value of such study, aside from its purely scientific value, it has been pointed out by Merriam, Cockerell, and others that a study of the natural plant and animal life of a region is a good indication as to the crops that can be best grown in a given area and soil.

The data here given is not alone that gathered with the expedition this summer but includes as well the results of the past four years' study. The region which has been most closely studied is that portion of Bernalillo County in the vicinity of Albuquerque and the western slope and top of the Sandia Mts. Quite extensive collections have been made also in the Manzano Mts. the Jemez Mts., and with the Conservation Commission in the vicinity of Mt. Taylor. Small collections have also been made about Silver City, Socorro, Belen, Mountainair, Santa Fe, Española, Taos, and Wagon Mound.

Topographically the region divides itself into three types

- (1) (Report of the Zoologist with the Survey.)

(1) the mountains, (2) the plains and "mesas," an arid steppe type and (3) the valleys; and the plant and animal life follows this distinction very closely. Even the birds that seemingly could so readily pass from one type to another, in the main do not do so but remain quite distinct. In the mountains for instance, are robins and other thrushes, crows, chickadees, nuthatches, cañon-towhees, piñonettas, etc. On the steppes are shrikes, sparrowhawks, western quail but especially and vastly outnumbering all others combined, prairie horned-larks. In the valleys are meadow-larks, Mexican finches, wild geese and ducks, and at least three species of blackbirds and more of sparrows.

THE PLANT ASSOCIATIONS AND SOCIETIES ¹

As the distribution of animals and especially insects is so closely dependant upon that of plants, a study of physiographic plant ecology forms a necessary foundation for the study of physiographic animal ecology, but as the author has treated the former in another place ⁽²⁾, a mere outline of the chief associations and societies to serve as a means of naming those of the animals will suffice here. The names of the plant associations form a most satisfactory nomenclature for animal habitats and one that can be recognized at a glance. No animal, of course, occupies all of the places in its area of distribution so that a mere statement of the latter gives but an imperfect idea of where an animal may be found. You say, for instance, that a certain beetle occurs in New Mexico and Arizona. Yet there would be many places in that territory in which you would search in vain for it. If, however, you stated that it occurs in the *Pinus ponderosa* formation there, you have really told one where to look for it, and since an animal nearly always occupies all suitable habitats within its area of distribution, you could probably find it in most

(1) For the benefit of such of our readers who are not familiar with the terms used in plant ecology it should be explained that an association includes a tract of land dominated over most of its extent by some plant or group of plants that are usually found growing together, as the Yellow Pine, White Oaks, and Wild Gooseberries. An association should cover considerable territory. A society is a subdivision of a formation where some other plant or one only of those composing the formation is locally dominant, such as the Long-leaved Poplar or Red Cedar Societies along streams in the Yellow Pine Formation.

(2) Soon to be published in the Botanical Gazette.

places in this area and formation. For this same reason the use of these formations is usually to be preferred to that of the much more inclusive zones of Merriam. The Upper Sonoran for instance includes such diverse formations as the grassy steppe about Albuquerque and the Piñon forest of the Sandias, and, as can be readily seen by referring to the lists, the latter includes very many forms not found in the former and vice versa. In fact the species not common to the two are nearly as numerous as those that are. In other words these formations represent a very definite complex of environmental factors and one which is fairly uniform wherever it occurs, whereas "New Mexico" or "Sonoran" does not stand for anything nearly so uniform in the matter of environment. On the other hand, when an animal occurs in several formations the term "Upper Sonoran" may be very convenient as it obviates the necessity of repeating all of the formations and I have frequently used it in the following pages.

The formations divide themselves into the same three great groups as the topography but each is capable of further subdivision as follows:

Valleys	{	The mud flats of the Rio Grande	{	Merriam classed this as Lower Sonoran but Cockerell and others do not agree with him but call it a transition between the upper and lower
		The Cottonwood Forest		
		The Juncus Pepperweed Society (a meadow)		
		The irrigated fields		
		Acequia banks		
Dissected edge of the "mesas"	{	Grassy meadows, poorly represented along the Rio Grande but well developed below Acoma and other valleys	{	
		Bigelovia Association		
		Rayless Golden-rod Soc.		
		Dalea scoparia—Croton Soc. (in very sandy places)		
		Yucca Society. (also in sandy soil)		
"Mesa"	{	Sand Dunes	{	Upper Sonoran
		Bigelovia Hills		
		Hymenatherum Hills		
		The grassy Steppe Formation (This includes the lower "mesas", those free of trees. The higher parts are included in the next)		
		Cedar Association (Juniperus monosperma)		
Mountains	{	Opuntia arborescens Society.	{	Transition Zone
		Piñon Association		
		Box-elder Society		
		Pinus ponderosa Association (Yellow Pine)		
		Oak Chaparral (on high slopes)		
		Populus longifolia Society (In the cañons)		
		Red Cedar Soc. (on travertine deposits along streams)		
		Meadows along mountain streams		
		Meadows on high slopes		

Mount's.	{	Douglas Spruce Association	}	Canadian Zone
		Quaking Asp Society		
		Blue Spruce Association	}	Hudsonian
		Meadow Societies		

LIST OF SPECIES COLLECTED WITH NOTES ON THE SAME.

In the following lists species are in general not duplicated under each association in which they may occur but are listed under that one in which they are most abundant and if they are at all common in any other association a note is made of that fact. If the breeding place is known the species is always listed there, as ecologically an animal is "at home" only where it breeds. Some of the species have been collected only once or a few times. These are listed where found although we are aware that to place an animal ecologically on only a few collections is mere guess work. Since however so little collecting has been done in this region it seemed best to tabulate all species leaving it to some future entomologist to make corrections. Since all such cases are mentioned in the note under the same no harm will be done if the reader will remember that one marked rare or uncommon may really belong somewhere else. Beetles which are not in Fall and Cockerell's List of Coleoptera for New Mexico are marked (*). The same is used for Orthoptera not in Cockerell and Scudder's list or for Diptera not listed for New Mexico in Aldrich's Catalogue. § means that the species has not been reported from that locality in the lists cited. ** indicates that the species has not been reported from New Mexico previously or that it was named from specimens sent from here. (N) means that the species is of northern or north-eastern origin, (S) of southwestern or Sonoran. The Coleoptera were determined by Prof. H. F. Wickham, the Orthoptera by Prof. Lawrence Bruner, the bees by Prof. Cockerell, the hemiptera by Wm. Gerbart or Heinman of the National museum to which institution all other groups were also sent. The Cicindelidae were almost determined by Dr. V. E. Shelford of the University of Chicago to whom the writer is deeply indebted not only for many valuable suggestions and help in the local field but also for his training in animal ecology. Many species yet await identification and

are not included in this sketch, the purpose of which indeed is not to make a list of the species in this area but to treat of the local distribution. Those found in dwellings only and introduced species found only on cultivated crops have been purposely omitted. Unless otherwise stated the locality is understood as being in the vicinity of Albuquerque or the Sandia Mts.

BLUE SPRUCE AND MEADOWS (HUDSONIAN ZONE)

Very little collecting was done here. The association was visited several times on North Sandia Mountain, once on Old Baldy of the Jemez, and on the very top of Mt. Taylor. The following were collected here only.

§ *Cicindela longilabris* (an undescribed variety according to Shelford.) Previously reported from Santa Fe and Beulah only.

§ *Chrysomela auripennis*, *Say*.

An *Andrena* (Perhaps *fragariana*, *Gaen.*)

§ *Irbisia brachycerus*, *Uhl.* On Old Baldy of the Jemez Mts.

In addition the Painted Lady, *Pyraeas cardui*, was more abundant here than anywhere else although it occurs throughout our region and in fact "wherever the thistle grows" (Holland). On the very top of Mt. Taylor was observed a very curious collection of the lady-beetle, *Hypodamia convergens*. There were several thousand of them massed in an area of only about a square foot. They did not seem to be copulating. Under the stones under the mass of beetles were other thousands of old faded elytra of the same species, showing that the same phenomenon had occurred here the previous year. A similar collection was seen on one of the very topmost peaks of the Sandias in the fall of 1907. Were they seeking a place to hibernate? It was August and September respectively and early fall on those high peaks.

DOUGLAS SPRUCE ASSOCIATION

This is the most mesophytic Association we have and the most dense forest. It does not make a continuous "zone" anywhere with us but occurs as scattered patches in the

deeper cañons and on north-facing slopes. It is very poor in insect life as is the preceeding. It is the home of the chickadees and the nut-hatches but contains no lizards of its own.

Coleoptera.

* *Aphonus clunalis*, *Lec.* (one only.)

** *Bruchus* sp. "probably new." Common on *Ptelea*.

Brupestis maculiventris, *Say* (N.)

§ *Chauliognathus basalis*, *Lec.* Descends into the *Pinus ponderosa* association.

Very common especially on fire-weed in this Association.

§ *Eleodes tricosata*, *Say*. Old Baldy of the Jemez. Wickham reports it from Albuquerque but it certainly is not common there.

§ *Monohamus maculosus*, *Hald.*

Hymenoptera.

Camponotus pennsylvanicus. (The Carpenter Ant.) Very common here and in the Yellow Pine Ass'n. Never seen outside of the mountains.

Sphex extremitata, *Cress.*

Tentredo uncinatus.

Vespula pennsylvanica, (*Sauss.*)

HEMIPTERA

Apeteticus (*Podiscus*) *bracteatus*, *Fetch.* On *Acer glabrum*, *Torr.*

Brochymena obscura. Descends into the Yellow Pine and Piñon Ass'ns.

Camptobrochis grandis, *Uhl.* On spruce.

Corythuca arcuata (*Say*) *Morrill.* This lace-bug is very common on *Ptelea* and oaks.

Cyrtolobus carinata, *Stal.* On *Berberis fendleri*.

Cyrtolobus trilineata, *Say.* do.

Leptoglossus occidentalis, *Heideman.*

Phytocoris eximus, *Reut.* On spruce.

DIPTERA

Cuterebra americana, *Fab.* (Ga. to Cal.)

Dejeania vexatrix, *O. EQ.* At *Aralia racemosa* in bloom.

* *Jurinella ambigua*, *Macq.* At *Aralia*.

* *Paradejeania rutiloides*, *Jarmicks.* At *Aralia*.

Peleteria tessellata, *Fabr.* (N) "Hudsonian Zone in N. M."

Arctophila flagrans, *O. S.*



"A Pine Park and Slope on Mt. Taylor."

LEPIDOPTERA

Chrysophanus virginensis, *Edwards*.

Epargyreus tittrus, *Fab.*

Eresia texana, *Edwards*. (S) One only.

Grapta zephyrus, *Edwards*. Not very abundant, in this and the Yellow Pine Association only. Never seen outside of the Mts.

Hesperia montevaga. Abundant here, less so over the mountains generally.

Occurs from the Middle States to Arizona according to Holland.

Papilio daunus. Common. Somewhat less so in the Yellow Pine Association.

Vanessa antiopa. (N)

PINUS PONDEROSA (YELLOW PINE) ASSOCIATION

Machilis, sp.

A large aperiodous insect, a fish moth (*Lepismidae*), is common here among pine needles. *Lepisma*, I have not seen here.

ORTHOPTERA

Arphia tenebrosa, *Scudd.* Most common on the lower edge of this Association. One was caught on the "mesa."

Leprus cyaneus, *Ckll.* One only taken.

Melanoplus punctulatus, *Uhl.* Also in the Jemez Mts.

Trimerotropis cincta. Some in the Spruce and Piñon Assns.

COLEOPTERA

* *Chrycochus coboltinus*, *Lec.*

§ *Cleonus trivattus*, *Say.*

Cymindis laticollis, *Say.*

§ *Galeruca externa*, *Say.*

Lecontia discicollis, *Lec.* Under bark of pine stumps.

Lucanus mazama, *Lec.*

Lygistopterus rubripennis, *Lec.* One only.

§ *Polemio platyderus*,

Trox sonorae, *Lec.*

HYMENOPTERA

Andrena apacheorum, at blossoms of wild plum. Not quite sure of the species.

- A. salicinella*, *Ckll.* On willow in bloom. April 2nd.
Bombus juxtus, *Cresson.* At *Frasera.* Also in Jemez Mts.
 at *Cleome.*
Clisodon terminalis, *Cr.* At *Rudbeckia.*
 * * *Melisodes atrifera sandiarum*, *Ckll.* Type locality.
Psammoshares atrox, (*Dahl.*) Jemez Mts.

HEMIPTERA

- Ceresa albidosparsa*, *Stal.* Common in the Jemez Mts.
 from which it descends the valley to Albuquerque. I have
 not collected it in the Sandia Mts.
Clastoptera obtusa (*Say*) Jemez Mts.
Cyrtolobus vau, *Say.* Jemez Mts.
Lopidea confluens.
Oncometopia lateralis, *Fabr.* Taken in no other associa-
 tion.
Pentatoma lignata, *Say.*

DIPTERA

- Anthrax fulviana*, *O. S.*
Asilus limpidipennis, *Hine.*
Arctophyla flagrans, *O. S.* (N) Alaska to S. D. according
 to Aldrich.
Asilus tenebrosus, *Will.*
Carphotrichia culta, *Will.* Jemez Mts.
 * *Microphtalma disjuncta*, *Wild.* (N) From N. H. to Ga. to
 S. D. and Cal.
 * *Odontomyia nigrirostris*, *Loew.* Jemez Mts.
 * *Pachycerina dolorosa*, *Will.* Jemez Mts. Another north-
 ern (Colo.) type apparently absent from the Sandia Mts.
 * *Stenopa vulnerata*, *Loew.* Another northern type, very
 abundant in the meadows along the upper Jemez River, which
 is entirely absent from the Sandias.
Tetranocera plumosa, *Lev.* As the last.
Tabanus centron, *Martin.* This and the next two are
 equally abundant in the Pinon Assn. but extremely rare on
 the "mesa."
T. intensions, *Towns.*
T. punctifer, *O. S.*

LEPIDOPTERA

- Basilarchia weidelmeyeri.* Abundant in the canons of the

Sandia Mts. where oaks are abundant. Less so in the Jemez and on Mt. Taylor where the oaks are not as common.

Adelpha californica.

Plestia dorus.

Thanaos persius, *Scudd.*

Thecla damon discoidalis, *Skinner.*

* *Thecla halesus*, *Cramer.* Abundant about the oaks.

The red-bellied Horn Toad (*Phrynosoma hernandesii*) is particularly characteristic of this association but descends into the next.

CHAPARRAL OF HIGH SLOPES AND MOUNTAIN TOPS.

This society, although belonging to the same Pine Association differs from the typical pine forest in that the trees are scattering and the herbs are somewhat different. The following are particularly characteristic of this society.

ORTHOPTERA

Arphia arcta. Descends to the Cedar Association. This and the next are particularly noteworthy for the loud noise that they can make comparable with an active boy, a stick, and a picket fence. They make this loud crackling only on the wing and while the sun is shining and often a considerable number at the same time i. e. one starting up seems to excite the others. These concerts would seem to be of the nature of courtship performances although Sharp in the Cambridge Natural History states that the reason for these performances so common among Orthoptera is obscure.

Circotettix undulatus. Makes the loudest noise of any in our region. Very rare outside of the Yellow Pine Ass'n.

Hippiscus neglectus. One only (N).

H. tuberculatus. "King Grasshopper." One only.

Trimerotropis ferruginea. Not common.

COLEOPTERA

Anthoxia aeneogaster, *Lap.* "Common in northern N. M."

HYMENOPTERA.

Megachile fortis, *Cr.*

Melissodes grindeliae. These bees were taken from the blossoms of *Pentstemon* where they had retired for the night and were perfectly inactive when found, about 6 P. M.



"Piñon and Yellow Pine Association."

HEMIPTERA

Chelinidea vittigera, *Uhl.*

LEPIDOPTERA

Atrytone taxiles, *Edwards.*

POPULUS LONGIFOLIA SOCIETY

This is of such small area and is so strictly limited in its distribution to the immediate vicinity of the streams that its insect fauna is in the main that of the *Pinus ponderosa* Ass'n. The following Coleoptera, however, seem characteristic:

Blapstinus sp.

Eleodes extricata, *Say.* A peculiarly mountain type, none having been taken from the mesa.

§ *Melanotus fissilis*, *Gyle.*

§ *Monilema annulatum*, *Say.* One only.

Tricolepsis inornata.

BOY-ELDER SOCIETY

The remarks made above concerning the Long-leaved Poplar Soc. apply also here; nevertheless the following clearly belong here.

§ *Cicendela oregona*, *Lec.* An immense swarn of this species was encountered in July 1909 in Canon de Guadalupe on the Sandia Reservation. They were collected along the stream and for several rods each stone averaged at least two dozen per sq. ft. of area. There must have been several tens of thousands of beetles in the assemblage. The upper parts of the stream had recently gone dry and this may have caused the beetles to congregate around the remaining water.

Leptocoris trivittatus. This "Box-elder Bug" has followed its host to Albuquerque but is not as abundant there. It is by no means confined to the tree or its immediate vicinity, however but occurs on the very top of the Sandia Range. It is active as early as Mar. 11, beside the snow drifts in the mountains.

MEADOWS

In the Jemez Mts. in this association there are mesophytic meadows along the streams where grow in profusion such northern plants as *Rudbeckia*, blue violets (scarce in the Sandias), *Solidago*, *Malva*, timothy (*Phleum*)

Here the following were collected, mostly along the Rio Cebolla.



"A Mountain Meadow in the Yellow Pine Association." A saddle on Mt. Taylor. Here occur several species of *Cicindela Grama* grass is the most common one in the opening.

Tettix granulatus.

Xiphidium fasciatum.

§ *Diplotaxis punctata*, *Lec.* Reported from Albuquerque.

§ *Iphthimus serratus*, *Mon.* (N) Abundant in Colo., but absent from the Sandias.

§ *Leptura canadensis*, *Fabr.* (N)

§ *Megilla vittigera*, *Mann.* Abundant on golden-rod. Descends the Jemez and Rio Grande at least as far as Albuquerque.

§ *Trirhabda flavolimbata*, *Mann.* (N)

T. nitidicollis, *Lec.*

Bombus hunterii, *Greene.* At Rudbeckia.

PINON ASSOCIATION

ORTHOPTERA

Most of the species of this order found here are mesa forms but *Trimerotropis cyanea*, *Scudd.* seems to be especially at home here although it extends up into the Yellow Pine Assn.

COLEOPTERA

Acmaeodera variegata, *Lec.* One only.

§ *Anaspis rufa*, *Lec.* Reported from the Sierra Blanca Mts. and Las Vegas Hot Springs.

§ *Allorhina niutabiles* (S) Mt. Taylor. Never seen around Albuquerque.

Anelastes drurii, Manzano Mts.

* *Buprestis lanta*. (?)

§ *Collops hirtellus*, *Lec.* Manzano Mts., a northern type previously reported from Taos Peaks and Coolidge.

Coccinella 9-notata (N) Hibernates under yucca stems. Occurs also in all previous associations but very scarce in the lower ones.

§ *Cosiniptera axillaris*.

§ *Lebia viridis*, *Say.* (N) From the Cedar to the Pine. Assns., inclusive.

On *Asclepias* and *Fallugia*.

* *Melandra striata*.

§ *Pentataria fuscata*, *Lec.* On golden rod and *Carex* (Jemez Mts.) Croton.

§ *Platynus placidus*, *Say.* Under a Piñon very high up on



Scene in the Piñon Association—Mount Tallor.

the slope (9000 ft.) and should quite probably be placed under the preceeding association. (N)

Prionus Californicus, *Mats.*

Pseudallonyx sp. Manzano Mts.

* *Salinas omogera*, *Lec.* Manzano Mts.

* *Silvanus planatus*, Manzano Mts.

§ *Anthocomus ventralis*, Manzano Mts.

HYMENOPTERA

Colletes gilensis. On a wounded pinon cone.

Diadesia australis, *Cr.* At *Fallugia*. This descends to the "mesa" where it was captured on *Phacelia corruga* and *Malvastrum dissectum cockerelli*, var. *rinconis*, *Ckl.* On *Fallugia*, prickly pear, *Opuntia arborescens* (Mountainair). Also at Belen.

HEMIPTERA

Brochymena affinis, *Van D.*

Peribalus limbolaris, *Stal.* Very abundant on blossoms of *Yucca baccata*.

LEPIDOPTERA

Epargyrus tittyus. *Fab.* seems to belong here.

Phycoides mylitta.

Hesperia montevaga.—In this and the next assn. (E)

ALONG STREAMS

In this association one here finds several species of *Tettix* which are quite abundant. There are a very few grouse locusts to be found along the Rio Grande. With this exception these insects are entirely confined to the immediate edge of these mountain streams.

Simulion—Black-flies breed in large numbers in the streams.

Agabus lugens, *Lec.* A mountain type.

Bembidium transversale, *Dej.*

Cicindela rufiventris.

Deronectes striatellus, *Lec.* (N)

Rhantus binotatus, *Harr.* (N) Mts. only.

HEMIPTERA

Salda sp. These shore bugs are found in no other situations in our region.

The lizard of this Association is *Sceloporus undulatus*. It ascends into the Yellow Pine Assn. and descends through the Cedar Assn. to the edge of the mesa but never onto the open mesa itself. It is a better climber than any other of our species and frequently climbs trees. Its favorite attitude in fact is at the dead end of a branch but always a low one. This is also the home of the Western Diamond-back Rattlesnake.

CEDAR ASSOCIATION. (*Juniperus monosperma*)

ORTHOPTERA

Hesperotettix viridis. On *Asclepias* and *Gutierrezia* only as far as our observations go and only in a narrow belt at the base of the mountains, on the extreme lower edge of this association.

Hippiscus corallipes. Seems to be particularly abundant here only, but it occurs on the mesa occasionally, and generally over the mountains. We took it on the very top of Mt. Taylor.

Trimerotropis montanus, *Bruner*. Have taken this in the Sandia Mts., Jemez Mts., and on the mesa.

COLEOPTERA

Acmaeodera pulchella, *Hbst.* On *Fallugia*.

Asida opaca, *Say*. Taos, Mt. Taylor, Jemez, Sandia Ranges. Also common in the piñon and pine assns.

Calosoma peregrinator, *Guer.* One on the "mesa".

Eleodes obsoleta, *Say*. This seems to be a little more abundant here altho it is common on the mesa also. Very common about Cabezon (§) in this association. On Mt. Taylor (§) it ascends into the Yellow Pine Forest. Taken at Acoma (§). Commonly taken in hibernation under yucca rosettes.

* *Luperodes varipes*, *Lec.* One only taken.

§ *Tetraopes femoratus*, *Lec.* On *Asclepias* which is more abundant here than elsewhere.

Collops bipucutatus, *Say*.

HYMENOPTERA

Andrena prunorum, *Okll.* and its variety *gillettei*, *Okll.* are Upper Sonoran in their distribution here. They have been taken from *Tamexis*, wild plum, wild gooseberry, (*Ribes*),

Rhus, and *Crataegus* (in cultivation), from Mar. 31 to April 26.

Bombus nevadensis, *Cres.* Especially at *Chrysothamnas pucherlimos*.

Halictus aberrans? At Plum and *Ribes*.

H. amicus, *Ckll.* At *Rhus*, *Salix* and a yellow composite.

H. pectoraloides, *Ckll.* At *Ribes*.

H. sp. perhaps *pruinus*, *Rob.* At *Ribes*, *Rhus*, and wild plum.

Melissodes agilis, *Cr.* At *Cleome*.

Perdita zebrata, *Cr.* Jemez Mts. Aug. At *Cleome*.

Sphecodes sophiae, *Ckll.* On *Rhus*, uncommon.

Odynerus (*Ancistrolrus*) "near to *sexcingulatus*". Around *Ribes* and wild plum.

Pepsis formosa. The Tarantula Killer ranges over the entire Upper Sonoran but is particularly abundant here.

HEMIPTERA.

Lygaeus bicricis. Widely distributed but especially abundant here.

L. lateralis, *Dall.* Active until Nov. 1.

L. turcicus var. *reclivatus*, *Say.* Especially common on *Asclepias*. Common also on the same plant in the arroyos of the "mesa". Collected at Española but not at Taos. Pine Assn. in Jemez Mts. During the winter it is very commonly found under yucca rosettes.

LEPIDOPTERA.

Litocala sexsignata. Abundant during Mar. and April about blooms of *Rhus*, *Ribes*, and wild plum.

Pieris occidentalis.

OPUNTIA ARBORESCENS SOCIETY

On the fans at the mouths of the cañons there usually develops a dense thicket of this cactus which is found also very abundantly throughout the Cedar and Piñon Associations. It is entirely absent from a large part of the grassy mesa and occurs only sparingly elsewhere until one approaches the Cedar Assn. The following insects are very characteristic of this plant.

Carpophilus pallipennis. This beetle deserves to be called "The Cactus Nitidulid" as it is almost universally present on cactus flowers especially of this species. Every blossom will

commonly show from a dozen to a hundred or more individuals. In addition to eating the pollen they frequently consume the petals also. This insect was also taken from among fungus mycelia under bark (in Spruce Assn.) on dead animals, under manure and stones, and on other blossoms.

Presmis pocularis, *Dalm.* One of the very noticable things about this cactus is the abundance of dead and dying limbs and whole plants. Although rabbits and starving cattle help in producing this state of affairs, it is due chiefly to the work of this and the next insect. This peculiar cerambycid may be seen from June to Aug., on nearly all plants of this species, which it apparently never leaves. The female is usually to be seen carrying her much smaller mate, even when engaged in copulating in the branches. The larvae bore in the tissues of the plant causing extensive dark colored areas and often the death of the branch. This long-horned beetle, in its degenerate wings, dark color, and cylindrical form, shows a most interesting resemblance to the Tenebrionidae of the genus *Eleodes* so characteristic of this region. As it never leaves its host it has no need of wings which would probably be a disadvantage in that it might be blown off during the terrific sand storms of this region.

Proarna valvata. This cicada is also very abundant on the tree cactus, but, unlike the last, also occurs on the prickly pears. During the last of June and the first half of July the adults are abundant and the loud calls of the males are heard on every hand when the sun is shining. But let a cloud obscure the sky for a moment and all is hushed. They suck the sap of the plant and here also the eggs are laid, an operation that so engrosses the attention of the females that they will frequently allow the collector to approach and pick them off with the fingers. The larvae are to be found on the roots of the cactus which thus furnishes them their food throughout life. They lie in small mud cells among the roots and apparently feed all winter as well as summer.

Rhopalophorus longipes, *Say*. Was taken from *Croton Texensis* which is common in this society (N.)

§ *Tragidion coquus*, *L.*, also belongs here apparently as does

Cleonus (Cleonopsis) pulverulus, Lec

The lizards here are especially *Crotaphytus collaris* and another. This association is also the home of the Western Diamond-back Rattlesnake. I have never seen it in any other.

The common towhee and the western blue-bird are characteristic. The latter appears again in the Valley but is less common there. It is absent from the mesa.

SHORTGRASS OR "MESA" ASSOCIATION

This includes the arid grasslands or steppe which is entirely or nearly free of trees. In the vicinity of Albuquerque this association is coextensive with the comparatively uniformly sloping monoplain known locally, as elsewhere in the southwest as the "mesas." To the northwest and elsewhere in the Territory these "mesas" (not of course true mesas) may rise higher and be occupied by the Cedar or even the Pinon Associations. For the sake of brevity we have used the name "mesa" to designate this treeless, grassy steppe. Faunistically we will recognize three subdivisions. The higher parts, where the precipitation is greater or where there has been less serious over-grazing, are covered by a very good growth of grass. The drier or most seriously overgrazed portions have been invaded by the composite *Gutierrezia* to such an extent as to deserve to be designated The *Gutierrezia* Society. The arroyos that cross the "mesa" form the third subdivision. Many types occupy all these situations to an apparently equal extent. These we will consider first.

THE "MESA" GENERALLY.

ORTHOPTERA

Trimerotropis vinculatus. This is preeminately the mesa grasshopper being more numerous in individuals than all other orthoptera combined. It ascends far into the mouths of wider canons with the mesa type of flora and fauna. It is common in the Cedar Ass'n., and ascends even into the Yellow Pine Ass'n., but is by no means so dominant there. It is fully as characteristic of the *Crysothamnus* Association. It seems to be the common grasshopper over most of New Mexico. At least this is true from Silver City, Deming, Rincon, to Taos on the north and the continental divide on the west, and Wagon Mound on the northeast. It is very vari-

able in color and the variations have a very definite relation to that of the ground around them, being very light on sandy soil, mottled on pebbly hills and darker among the pines where there is more vegetation. The first adults were seen on April 21st., this year and they are often quite numerous in early December.

Migrations. During the several evenings in early September of this year the city of Albuquerque was invaded by large numbers of this locust. The same phenomenon has been noticed to a less extent during each of the four autumns that I spent in this region. The cause of this movement from the "mesa" into the valleys is this. If the summer rains start in early in July or, as this year, in late June the grass and herbs on the mesa make an early and vigorous growth to which the locusts quickly respond by rapid increase in numbers. When the rains cease these grasses quickly mature and dry, making most excellent hay *in situ*. This, although very good feed for herbivorous mammals, is apparently useless to the locusts, which migrate to the depressions of the mesa and then, as these also dry, out to the valleys. Whenever there occurs an early and brief rainy season the farmers of the valleys may expect, about four to six weeks after its close, a visit in force from these mesa insects.

COLEOPTERA

* *Anepsius delicatulus*, *Lec.*

Asida convexicollis. Also Cedar Assn. Estancia Valley.

A. elata.

A. marginata. One seen eating a dead *Eleodes*.

A. marginata, var. *rimata*. Only near base of Sandia Mts.

A. sordida.

Tylosis maculatus, *Lec.*

§ *Cantharis deserticola*. Previously reported only from Walnut Creek, Grant Co.

Canthon ebenus, *Say*.

Paria sellatus.

Cicindela pulchra. Larvae found by Dr. Shelford in hard barren adobe on the edge of the mesa on the border of the *Chrysothemnus* Assn. It is more common on the more grassy mesa towards the Rio Puerco (July 1911.) Larvae

also found in similar situations in the Pinon Assn. on Mt. Taylor, Aug. 1911.

Cantharis deserticola, *Horn.*

Dermestes marmoratus, *Say.* Exceedingly common on the dried pelts of dead animals. The most common pelt beetle.

§ *Eleodes carbonaria*, *Say.* Also in Jemez Mts.

E. dispersa, *Lec.*

§ *E. caudifera*, *Lec.* This beetle was quite abundant in 1911, while previous to this year only two had been taken here.

E. gentilis, *Lec.*

E. sponsa, *Lec.* This seems from the records in Fall and Cockerell's list to be most abundant in Northern N. M. but my records are all from the mesa instead of the mountains.

Embaphion contusum.

* *Emmenastus convexus*, *Lec.* Extremely abundant under dung and *Yucca* leaves. It spends the winter in the latter but is not dormant except on the coldest days. It has been taken while eating pollen on *Polyanesia bracty*, *Gutierrezia* *Astragalus mollissimus* (Loco) Mar. 5th and on *Croton*. Also common in the Cedar Assn.

Hyporhagus opuntia, *Horn.* With the last, except for one on the blossom of the *Yucca* none have been seen elsewhere. Common.

Eupagoderes sordidus, *Lec.*

Eurymetopon emarginatum, *Csy.*

Hister militaris, *Horn.* Under dead animals, manure etc. Also at Silver City and Taos. (S)

§ *Lebia anticeps*, *Lec.* Only other record is Rincon.

Ligyris gibbosus. Abundant about electric lights in Sept. Extends up into the Yellow Pine Assn.

Nemognatha sparsa.

Nitidula ziczac, *Say.*

Nothopus zabroides, *Lec.* Also around city lights.

§ *Phylotreta pusilla*, *Horn.* Abundant, especially on *Cleome*, *Polanesia*, *Phaceli*. Extends up into the Yellow Pine Assn.

§ *Saprinus discoidalis*, *Lec.*

S. fimbriatus.



"The Plain Below Acoma."

S. lugens.

* *S. protusus.*

Pyrota mylabrina, *Cheor.*

Meloe sp. Was quite common about the base of Mt. Taylor and westward, but has not been seen about Albuquerque.

LEPIDOPTERA

The mesa as a whole is very poor in this order. The following are characteristic and a number of others await identification.

Lycaena acmon. Wagon Mound.

Meganostoma caesonia, *Stall.* Southern Dog-face.

Pachysphinx modesta.

Pholisora catellus, *Fab.* (N).

Terias mexicana.

Pronuba yuccasella, *Riley.* Is common in the blossoms of *Yucca glauca.*

Two other Teneids are common under the dead stems of *Yucca* all winter and often fly about on the warmer days.

HYMENOPTERA

Nomia nevadensis, *Cress.* A bunch of twenty males of this species were one morning taken from a head of *Hymonopappus* where they were massed like a diminutive swarm of honey bees.

Perdita callicerata.

Campyloneurus sp. Exceedingly common on the mesa specially in May, about the wild gourd vines.

Chelon sp. About *Astragulus caryocarpus.*

Ellis sp. ("Close to *hyalina.*") On *Croton texensis.*

Pogonomyrmex occidentalis, *Cress.* The low mounds surrounded by a space several feet in radius, cleared of all vegetation and covered with pebbles brought by these harvester ants, are one of the most characteristic features of the mesa. They form one of the chief sources of food for the "horned toads" which, if the colony is too active, sometimes have the tables turned on them. The larger species of *Eleodes* are very fond of the seeds of grass collected by these industrious harvesters and are often to be seen searching the ground for a seed that may have been overlooked. The habit of these ants of bringing their stores of grain out to air occasionally is well known. In this connection the writer once made an

interesting observation. One somewhat windy day in Sept. a hill was visited in which part of the ants were busily engaged in bringing out the grain to air and others were as busily engaged in carrying it back again. One ant would drop a grain and at once start back without a load into the hill for another, whereupon the grain would be at once seized by another ant and carried back into the granary. It is possible that this treatment is what the grain needed but it looked to the interested observer like a serious disagreement in the colony as to where that grain should be, a case illustrating the limitations of instinct in developing "team work."

Salix terminalis, *Say*.

Scolia haematodes, *Burm*.

DIPTERA

Asilus exceedingly common and a good many species.

Erax cinerascens, *Bellard*.

E. varipus, *Will*.

Promachus princeps, *Will*, common here and in all Sonoran.

Ablantus sp. Are common from early March on.

Anthrax alpha, *O. S.* Common.

A. welistonii, *Coq*.

A. fulviana, *O. S.*

Anastoechus nitidulus, *Lec*. Common and a favorite food of the robber-flies.

"Didges" are very abundant here. In May especially they make life miserable for the traveller by their continual assaults upon his eyes and ears.

NEUROPTERA

Brachynemurus ferox, *Walk*, and *B. nigrilabris*, *Hag*, are common over the whole Sonoran. The pits of the larvae or "ant lions" are common especially among the Piñons, but the adults come in large numbers to lights at the University.

Panorpa or "Scorpion-flies" have the same distribution but are less common. These may not breed on the mesa.

CENTIPEDIA AND ARACHNIDA.

The following are characteristic of this and the next associations.

Scolopendra sp. These large centipedes are quite common and frequently enter houses to the great dismay of

the housewives. They are often to be met with out of doors under cattle dung, stones, and piles of sticks. They are nocturnal in habit. Their bite is by no means as serious as represented. The common belief that they carry a poison sac on each of their feet is, of course, erroneous.

Thelyphonus sp. The whip-Scorpion, or, as is commonly known here, the "Vinagron," is rarely met with on the mesa. Though probably poisonous its bite is also grossly exaggerated in popular belief.

Lycosa sp. "Tarantulas" are somewhat more common than the last but much less so than the centipedes. Their bite is more serious than any of the above, but still not dangerous to most people.

MAMMALS

The mesa is the particular home of the coyote, the Black-tailed Jack-Rabbit and formerly of the Pronghorn (usually but incorrectly spoken of as the "antelope") which is said to have been common here twenty or thirty years ago and still occurs in limited numbers in the eastern part of the Territory. This and the Jackrabbit are true steppe forms in that they depend entirely upon fleetness for safety, never entering the the ground even for breeding purposes, as the coyote does. The Prong-horn is said by Thompson-Seton to be on the average the fleetest animal in the world. The coyote and the Jackrabbit are frequently seen as high as the Yellow Pine Assn. The latter avoids, in the main, the more open mesa, and is most abundant in the Cane cactus Soc. (*Opuntia arborescens*) and in the Dalea scoparia Soc.

Other common mesa mammals are Prairie Dogs, Ground Squirrels, and Pocket Gophers all true ground forms and to them may be added the Cotton Tail Rabbit which is more widespread in its distribution, ascending high into the mountains and occupying all of the valley. With possible exception of the last probably none of these rodents drink water except after the very occasional showers which may be months apart and seldom indeed is there any dew. It is a common belief that in every Prairie-dog town there is one hole that goes down to water. As it is two hundred feet to water in some of the "towns" east of Albuquerque the ridiculousness of the belief is apparent.



"The Enchanted Mesa, in the center of the foreground."

The coyote is not a strict carnivore in his appetite but is particularly fond of the "prickly pears." So much so, indeed, that they usually take the entire crop within a few weeks of the time they become ripe. The writer has been told they often raid a water-melon patch.

The Prairie Horned-lark which is, as we have said above, the bird of the mesa has a very interesting way of spending the night especially in winter when domestic cares do not necessitate other arrangements. Trees and shrubs being absent it has no place to perch. Instead it hollows out a hole on the leeward side of a hill or undulation of the mesa to fit its body so that its back is level with the surface of the ground and there it spends the night. It is interesting to note the native people when they sleep on the open mesa, as frequently happens, in winter, often make exactly the same arrangements.

These birds are gregarious in winter but separate in summer.

"THE GRASSY STEPPE" OF THE "MESA"

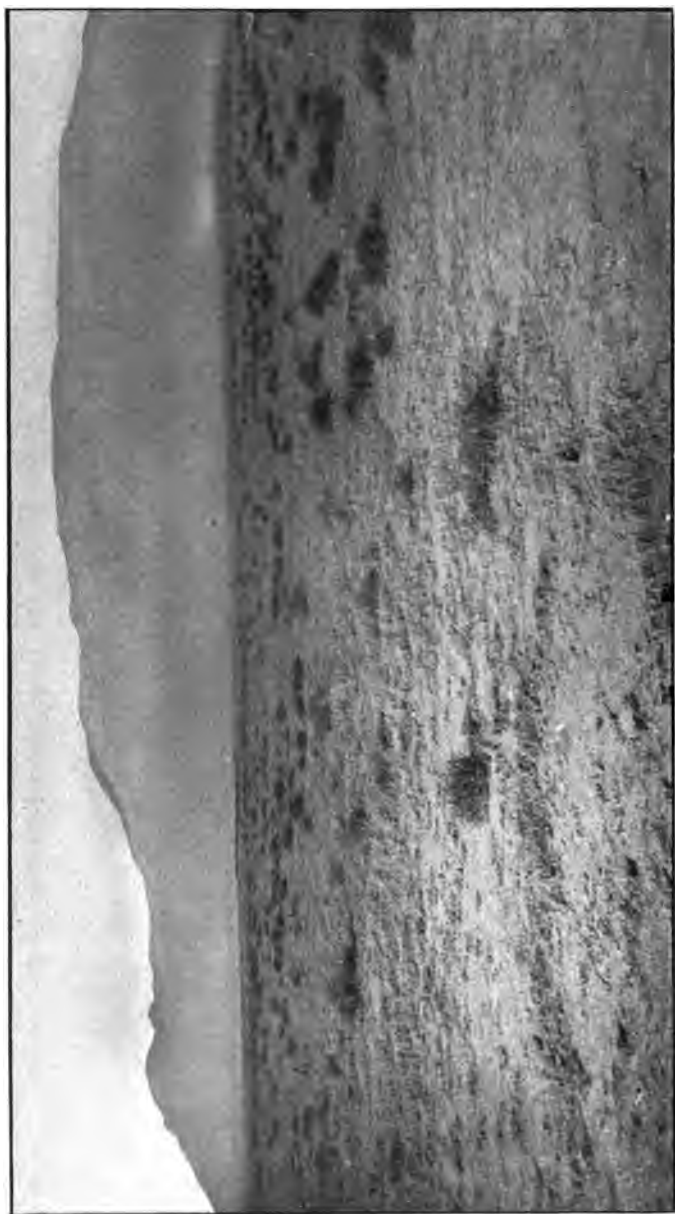
In addition to those found the mesa over, the following are nearly or quite restricted to these more grassy parts.

Hippiscus cerallipes, *Hald.* This species is by no means restricted to the mesa but ranges over the mountains generally, being found on the very top of Mt. Taylor, but always in places covered with a good growth of grass. Fall and Cockerell report it from Las Cruces. This in connection with the Mt. Taylor record will give it the immense vertical range of between eight and nine thousand feet, illustrating well the insufficiency of temperature alone as a controlling factor in distribution. Its ecological distribution i. e. good grassland, is much narrower. Those on Mt. Taylor seemed to have shorter wings than those about Albuquerque. The first adult was found on June 5th. and they were still abundant on Nov. 1st. Well-developed nymphs with wing pads were found in hibernation under yucca stems on Mar. 11, and late Nov.

§ Also collected about Acoma. It ranges to Utah.

Tropidolophus formosus, *Say.* All of my collections are from Aug. to Oct. Ranges to Colo. and Wyoming.

§ *Lycus fernandezii*, *Duger.* (S.)



"Typical mesa vegetation,"

This situation is here the particular home of the lizard *cnenudophorus 6-lineata*. It is particularly abundant between the Rio Grande and the Rio Puerco. The leopard lizard is also at home here as is the prairie rattlesnake. It is the most common snake on the mesa.

GUTIERREZIA ASSOCIATION

ORTHOPTERA

Stenopalmatus fasciatus. Quite common under cow manure and stones. Extends up into the lower cañons. This harmless "Child of the Earth" is regarded by most of the settlers of both Spanish and Anglo-Saxon descent, as being deadly in its bite.

COLEOPTERA

§ *Eleodes hispilabris*, Say. The most abundant of the genus here and in the Bigelovia Association. Also in the Valley and in the meadows below Acoma.

§ *E. leconti*, Horn.

§ *E. longicollis*, Lec. Also very abundant. One of these beetles when caught and held on its back squirted its ill-smelling fluid eight inches. When disturbed but not held they do not eject this fluid to a distance but elevate the abdomen and force out a drop which clings to the tip. They are clumsy creatures and in their efforts to stand on their heads they sometime fall over forwards.

E. carbonaria, Say. Eats pollen sometimes, not a common habit in this genus.

Eusattus convexus, Lec.

These large black, Tenebrionidae form a very large and characteristic feature of the fauna of this region. They are true children of the desert. Their elytra are grown together and to their backs, an adaptation to the fierce sand storms of the mesa. These wind storms drifting sand and gravel with them are a source of grave danger to the fauna of the region, even to man himself. The author has several times been caught out on the mesa when one struck the region with its usual suddenness and has stopped to observe the behavior of the animals. The prairie horned larks sought the shelter of the friendly arroyo banks. (The author has picked up these birds on the mesa during one of these storms. They were so exhausted by the buffeting that they

had received that they made no effort to escape). The digger wasps climbed into the *Gutierrezia* bushes and hung on for dear life with all of their feet wrapped about the stem, an attitude that they also assume during a shower; the snout beetles on the other hand backed down off the *Gutierrezia* and sought shelter in the ground; the wooly bears and other caterpillars curled up under the shelter of tufts of grass; most of the lizards sought their holes as did the harvester ants; but these Tenebrionidae went about their business as usual entirely oblivious, apparently, of the storm. Their heavy bodies kept them from being blown away and their heavy coat of chitin (it is hardly possible to force a heavy insect pin through some species) defied the drifting sand.

In their disposition not to be too particular as to what they eat they again show that they are true children of the desert. Anything from the tender green seedling leaves of a *Hoffmanseggia* to a dead member of their own species is good. They collect in large numbers about the carcass of a dead mammal. They will come out from their winter quarters under the rosettes of *Yucca* and other sheltered places any time in winter if it is as warm as 60 F. They have been taken by the author on Jan. 15. However these beetles begin to be less abundant at Taos. On the other hand they seem somewhat to shun the hottest hours of the day in summer, being then much more noticeable toward sunset.

HYMENOPTERA

Andrena jessicae. Also in the mountains to the lower edge of the Yellow Pine Assn. i. e. Sonoran. Frequents *Crataegus* (cultivated), *Tamarix*, Wild plum, *Fallugia*, *Astragalus caryocarpus*. From April 11 to June 6.

Anthophora affabilis, Cress. at loco (*Astragalus mollisimus*).

A. lesquerella, Ckll. From *Phacelia corruga*, *Tamarix*, loco. One from *Ribes* in the Sandia Mts. All in April.

A. porterae, Ckll. Very abundant about *Astragalus caryocarpus*, but also taken from Cherry, *Phacelia corruga*, loco, wild plum. Sonoran. From Mar. 25 to May 7.

* * *A. porterae* var. *watsoni*, Ckll. With the last. March 27 to May 15. During the last week in March this is the most abundant bee on the campus.

A. ursinus at *Astragalus caryocarpus*, *Phacelia corruga*, also in the mountains on *Ribes*.

Bombus morrisonii, *Cress.* Common at desert willow (*Cheilopsis*), and *Robinia neo-mexicana* but also at *Cleome*, *Rudbeckia*, (Jemez Mts.) *Asclepias* and wild plum in the mountains. Up into the Yellow Pine Assn. where it is largely replaced by *B. nevadensis*.

Bombomelecta fulvida, *Cress.* Abundant at *Astragalus caryocarpus*, but only two ever taken at loco. The smaller narrower blossoms of the latter keep away many bees that are abundant on the former. One of our most abundant bees early in March.

Dioxys phaceliae, *Ckll.* A very common bee about *Phacelia corruga*, *Biscutella wizlizenii*.

Halictus cressoni, *Rob.* At *Berlinderia* and "chimaja".

ARROYOS OF THE "MESA"

Brachystola magna, *Girard.* In the shallow depressions or "draw" in the mesa above the place where a definite arroyo develops there is found a society of which certain quick-growing annual grasses are most conspicuous. Here and here only have I ever found this big nearly wingless "Lubberly Locust," a good illustration of an insect restricted to a very limited habitat. It occurs west of San Mateo towards the continental divide (Gee) and extends east to Kans., Okla., Wy. and Colo. "Common in west central Texas." But Cockerell states that in his experiences it "frequents open rocky ground." (Scudder and Cockerell in "First List of New Mexico Orthoptera, Davenport Acad. of Science, Proc. 9.)

Heliastus aridus, *Bruner.* This grasshopper which was first described from Albuquerque occurs very generally over the mesa and well into the Cedar Ass'n. It seems however to be particularly abundant in these arroyos where its mottled colors agree perfectly with the gravelly surface. April 16 is the earliest date of appearance of adults which may be found in late Nov.

Pentatoma sayi. Abundant on *Croton* and Russian Thistle.

Reuteroscopus ornatus. Taken only on *Polynesia bracteata* which is confined to these arroyos.

* *Dicerca obscura.*

Eupagoderes wickmannii, *Sharp.*

Brachys aërosa, *Melsh.*

Eusattus convexus, *Lec.*

Epeolus occidentalis, *Cress.* At *Oreton texensis*.

* *Exema conspersa*, *Mann.* On *Fallugia*.

CRYSOTHAMNUS (BIGELOVIA) ASSOCIATION

This association occupies the dissected edge of the mesa and the higher gravelly parts of the valley of the Rio Grande. It occupies these rapidly eroding and hence unstable situations and is as a consequence the most xerophytic of all of our associations. Along the Rio Puerco we found this association immediately adjoining the Cedar Ass'n., while in the Albuquerque region the broad mesa intervenes. The reason for this is that the Rio Puerco is higher allowing the Cedars to creep down to the dissected edge of the valley. The plant *C. bigelovii* after which this association is named stops abruptly and completely at the edge of the more level mesa. It is very variable with many well-marked societies.

Batyلة saturalis, *Say.* On *Thelesperma*.

Crossidius pulchellus, *Lec.* Exceedingly abundant on *Chrysothamnus* when it blooms in late Sep. and Oct.

§ *Cystodemus wislizeni*, *Lec.* (S) Very common but apt to occur in colonies which however are spread over much ground. It occurs also on the mesa but not in the mountains. About the base Mt. Taylor.

Eusattus difficilis, *Lec.*

E. reticulatus.

* *Epitragus canaliculatus*, *Say.* Common also on the mesa and in the Dalea Society. It eats the pollen of Rayless Golden-rod and *Gutierrezia*.

Holopepta cacti, *Lec*

Otidoccephalus vittatus, *Horn.* On *Chrysothamnus*.

HYMENOPTERA.

Mellisodes menuacha, *Cr.*

Osmia cerasi, *Ckll.* Chiefly at *Phacelia corruga*. Some on *chimaja*. All in April.

O. cyaneoniteus, *Ckll.* On same plants.

O. hesperella. On *Phacelia* and cherry. One on a Piñon cone.

O. hypochry searohweri, *Ckll.* Common on *Phacelia* and *Astragalus caryocarpus* from April 7 to May 5.

O. integra, *Cress.* Less common on the same plants at the same time.

O. neo-mexicana. On *Biscutella* and one on cherry. One was observed to kill an individual of the next species in a quarrel over an early bloom.

** *O. watsoni*, *Ckll.* Type locality. Taken on *Biscutella* and *Phacelia* but most abundant of all bees on *Astragalus sp.* the first week in April 1911. Mar. 28. April 25.

Spinoliella australior On *Phacelia corruga* and cherry.

Tetralonia lycii. Most abundant on *Astragalus caryocarpus* but some on *Phacelia corruga* and *Astragalus mollissimus.* Mar 25 to Aug. 29. One in Valley.

** *T. phaceliae*, *Ckll.* Type locality. On *Phacelia corruga.* April.

Ichneumtidea abdominalis, *Cress.*

HEMIPTERA

Apiomerus pictipes. Common also in the Valley and up into the Piñon Assn. of the mountains but especially abundant here on *Chrysothamnus.*

A. spissipes, *Say.* Same.

Phymata erosa fasciata. Very abundant here on *Chrysothamnus* and in Valley on *Solidago*, in the yellow blossoms of which it is almost perfectly concealed. Not nearly so well hidden on *Croton texensis* and *Artemisia* on the mesa and quite conspicuous on the white blossoms where it also occurs but less commonly. In connection with the theory of aggressive resemblance it is to be observed that the instincts of this species, and I suspect it is general, lead it to usually select blossoms of its own color in which to conceal itself, but by no means invariably so.

P. wolfii, Less common. One had a honey bee as victim.

Prunassis venosa, *Uhl.* A few taken. The young of this cicada live on the roots of the prickly pear cacti.

Cicada cinctifera, *Uhl.* With the last.

LEPIDOPTERA

Calosesia coccinella. Exceedingly abundant on *Hymenopappus* during the third week in May. Less abundant on

Berlindiaria. It disappears completely by June 1st. It flies in the hottest sunshine of midday. Its conspicuous colors blend perfectly with those of the *Hymenopappus* blossoms but less satisfactorily with those of the *Berlindiaria*.

Erebus odora, *L.* This magnificent Noctuid is occasionally taken. (S)

Crambus laqueatellus. Caught abundantly in a trap during April and May, reaching its climax about April 20.

Cymatophora sp. Common in the trap during May and June and abundant about May 25.

Platea trilineata. From April 5 to May 9 very abundant in the trap and especially so about April 20.

SAND DUNES

Behind Atrisco they are entirely barren of vegetation and of insect life except.

Bembex sp., which here find conditions favorable for their colonies.

All the specimens of the scorpion (*Buthus*) that I have seen have come from this Association. Its sting is, to most people, not nearly as serious as it is represented to be. Persons that have experienced it say that for a short time only is the pain more severe than that resulting from the sting of a hornet and that it does not last as long.

Two lizards are extremely abundant in this formation. They are *Uta stansburiana* and *Holbrookia maculata*. They occur in small numbers only on the mesa or in the valley. On the other hand three other lizards that occur here are also and about equally common on the mesa itself. They are two species of "horned toad" and *Cnemidophorus gularis*. The horned toads go into hibernation in October, not to appear again until the following April but *Uta* and *Holbrookia* may be seen in limited numbers on any warm day even in midwinter. At this time their food is largely white ants, *Hyporhagus*, *Eusattus*, *Emmenastus* and other ground and *Yucca* beetles and in turn they furnish an important part of the fare of sparrow hawks and the butcher bird. The latter commonly impales them on the branches of the "desert willow" and other plants and usually, perhaps never, goes near them again, but in times of scarcity he too is driven to the use of dried meat and returns and eats these victims.

The horned toads bring forth their young alive. One that was kept in the writer's laboratory gave birth to twenty-nine one night. The young ones left their mother at once and scattered and when caught and confined together they showed no signs of any instinctive regard for each other. The female however made no attempt to eat her young even when provided with no other food.

After a rain the temporary pools here and on the mesa are occupied by hordes of small frogs "peepers" which breed here with extreme rapidity. It is seldom that these ponds last more than a week or two and yet in this short time many seem able to complete their metamorphosis. These extremely temporary ponds may also be occupied by a species of *Apus*, a crustacean.

CROTON—DALEA SCOPARIA SOCIETY

Dactylotum pictum, *hom.* The tricolored Grasshopper, or, as it was aptly named by one of my students, "The Barber-pole Grasshopper," occurs wherever its foodplant *Croton texensis* occurs in sufficient abundance.

We have never noticed it eating any other plant and have never found it in situations where there was not a good deal of *Croton*, so it seems entirely probable that it recognizes no other plant as proper food. Nearly full-grown nymphs were found hibernating under *Yucca* stems. The adult has very short wings which are useless for purposes of flight.

Anthonomus albipilosus, *Dtz.* Eats out the center of the seeds of *Croton texensis*, one in each seed.

* *Bruchus perplexus*. Common here on *Croton*. Also found on *Tamarix*, *Phacelia corruga*, *Fallugia*, and Ninebark in the Pine-Ass'n.

Cleonus (*Cleonopsis*) *pulverens*, *Lec.*

Europiella stigmosa (*Uhl*) *Reut.* On the blossoms of the *Dalea*.

Lygaeus pyrrhopterus, *Stal.* Specially abundant here but generally over the whole Sonoran.

Stagmomantis carolina. *L.* Sonoran generally but common here.

Bacillus carinatus and.

Diapheromera femorata, are the "Camponoche" of the na-

tive people and are credited with causing the death of many a poor horse. Perfectly harmless of course.

VALLEY

The following are found generally distributed over the valley.

ORTHOPTERA

Melanoplus bivitatus. This is strictly a valley type none having been taken from either the Sandia mountains or the mesa. It illustrates well the tendency of many eastern species to creep down the larger valleys. Taken from meadows below Acoma and from those on Mt. Taylor.

M. differentialis (*Uhler*) *Bruner*.

Microcentrum laurifolium. Very common on *Ampelopsis* (Virginia Creeper) *Orphulella galina*, *Scudd*. The most common locust along the Rio Jemez in Aug 1909.

Schistocerca albolineata, *Thomas*.

S. shoshone, *Thomas*. Common in 1907 especially.

Spharagemon sp.

COLEOPTERA

Agabus disintegratus, *Cr*.

Amara carinata, *Lec*.

Calosoma scrutator, *Fab*.

Cicindela fulgida, *Say*.

C. lepida *Dej*.

C. micans, *Fabr*. Collected by V. E. Shelford.

C. sperata.

Cybister explanatus, *Lec*.

Cyclocephala immaculata, *Oliv*. Not common.

Coscinoptera dominicana, *Fab*.

Diabrotica 12-punctata. Common everywhere but especially abundant on corn in the irrigated fields.

Diplotaxis pacata, *Lec*.

Epilachna corrupta, *Nels*.

Exochomus hoegei. *Gorham*.

Hypodamia parenthesis.

Harpulus pennsylvanicus, *Degeer*.

Microrhopala vittata. Very destructive to leaves on the golden-rod.

Polyphylla hammondi, *Lec*. § Española. This beetle makes

a peculiar and loud hissing noise by expelling air from under its elytra while lying on its back. Albuquerque also. Strictly a valley species.

Hoplocephalia bicornis.

Psyllobora taedata.

Pterostichum sayi.

Pyrota mylabrina, *Cheor*.

* *Sphenophorus* sp. ("Near to *plicatus*, *Say*.") Salt meadows along the Rio Jemez below Jemez Pueblo.

Chrysomela exclamationis, *Fab*. Very common on *Helianthus*.

Thermonectes ornaticollis var. *nigrofasciatus*.

Tropisternus limbatus, *Lec*.

Trox scutellaris. Abundant here and on the mesa.

ODONATA

Dragon flies breed here. Some of the larger as *Libellula forensis* range all over the mesa, often being found five or six miles from any possible breeding place. The damselflies on the contrary never fly far from home.

HYMENOPTERA

Agopostemon melliventris. Blossoms of *Croton*.

Apis mellifera, *L*. The honey bee frequents the following blossoms in about the order in which they are given. Alfalfa, *Chrysothamnus bigelovi*, *Dalea scoparia*, *Tamarix*, Black Locust *Fallugia*.

In late Sept. and Oct., the *Bigelovia* seems to be the chief source of nectar and pollen for the bees.

Megachile townsendiana.

Halictodes marginatus. At *Helianthus annuus*.

Melissodes humilior, *Ckll*. At *Solidago canadensis arizonica*.

M. obliqua, *Say*. At same Golden-rod.

Pterocheilus lewesii, *Cress*. Taken on Jan. 8 from under the bark of a dead cottonwood where they were hibernating in numbers.

Stizus godmani.

HEMIPTERA

Belostoma (Zaitha) fusciventris, *Dufour*.

Beunoa albidus, *Champ*.

Kolla (Tettigonia) gothica, *Say*.

Kolla (Tettigonia) hieroglyphica.

Kolla (*Tettigonia*) *hieroglyphica* var. *uhleri*, Ball. These last three insects are very abundant everywhere in the valley from Mar. to Oct., and although they usually escape notice, because of their small size they really do much damage to Alfalfa. Var. *dolobrata* of the last species also ascends into the Yellow Pine Assn.

Murgantia histrionica. The Harlequin Cabbage Bug is sometimes very abundant on *Cleome* and on cabbage sprouts that early in the spring grow up from stumps left in the field. It does not seem to be a very serious pest to the cabbage crop as in some localities in the East, possibly because it prefers the *Cleome*. Occurs also on *Bigelovia*.

Nysius senecionis, Schill. On *Solidago* especially.

N. ericae. More abundant even on *Senecio* than the last species.

Strictocephala festina, Say. On alfalfa where it occasionally does some damage, causing the stems to turn yellow and die. Also occurs with the next species on *Chrysothamnus pulcherrimus* in the Cedar Assn.

S. gilletti.

Anasa tristis. The squash-bug is very abundant on cultivated squashes. Although it has never been found feeding on any wild plants, it commonly hibernates under yucca stems miles from any cultivated fields, showing that the adult beetles commonly fly at least two miles.

LEPIDOPTERA.

* *Chorizagrotis balantis*, Grote. Not listed from N. M. in Holland's Moth Book. Another Colorado type that extends down the valley of the Rio Grande.

Heliothis armiger. Exceedingly abundant especially on sweet corn. Every year in the writer's garden for the four years that he tried to raise the crop it was infested by at least one of these "corn-ear worms" and more generally harbored three or four.

Pieris rapae. Common in the valley but does not seem to have become established in the mountains.

Here only one occasionally finds a toad (*Bufo* sp.) and frogs (*Rana virescens*) are fairly common.

MUD FLATS OF RIO GRANDE.

ORTHOPTERA.

Dissosteiria caroliniana, *Scudd.* This "Road Duster" which in the East is to be found in the driest of situations with us clings very closely to the moist valleys. It is common here and in the meadows along the mountain streams but is very rare on the mesa and scarcely less so over the Sandias generally. This is by no means an isolated case but on the other hand illustrates a general tendency of eastern forms that occur here. Dr. V. E. Shelford noted the tendency among tiger beetles. The explanation is that the situations is nearer the water here have about the same degree of humidity as the drier places in the more moist east.

Tettix Several as yet undetermined species occur here in considerable abundance.

COLEOPTERA.

Bembidium corax, *Lec.*

B. coxendix, *Say.*

B. dolosus

B. incurvus

B. nubilosum

B. versicolor.

§ *Cicindela hirticollis*, *Say* This one breeds nearer the river than any of the other Tiger-beetles. Its larvae are common in the higher parts of these mud banks.

C. repanda, *Dej.* comes next. Its larvae are found along the banks of the river which mark the limit of the usual high water, the burrows of the preceeding species being covered at these times.

Haltica obliterata, *Horn.* Abundant here and as high up as *Espanola*, especially on young willows which it frequently entirely defoliates. It is uncommon on *Fallugia* in the valley but has never been collected from this plant either on the mesa or in the mountains.

Tachys sp. This bright golden colored beetle was very abundant along the Rio Jemez below Jemez Pueblo. They were found along the water's edge buried in the sand, each handful contained from several to a dozen.

Gelastocoris oculata, *Fab.* Here and along most mountain

streams of any size in the Santa Fe region and on Mt. Taylor. It seems to be entirely absent from the Sandias although there are many streams there that would seem to be entirely suited to its needs.

THE COTTONWOOD FORESTS

These are so open that they are invaded by the grasses and herbs of the open parts of the valley and there are not as many species here as one would expect. The following are however characteristic:

Hypantia cunea, *Drury*. The Fall Web-worm is common here as along the city streets and on the cottonwood generally.

An unknown leaf-miner does a great deal of damage to these trees. In many cases nearly every leaf on a large tree will become completely riddled by Sep. or late Aug.

Cicindela vulgaris, *Say*. Breeds in the hard ground among the cottonwoods.

§ *Dicerca prolongata*, *Lec*.

* *Proctocanthus rufus*, *Will*. Is occasionally found on the mesa but it is more common on dunes in the valley covered at least partly by the cottonwoods.

And we must not forget the mosquitoes that, when the Rio Grande is high, breed in countless multitudes in the ponds along the valley.

JUNCUS—PEPPERWEED SOCIETY

This is an alkaline meadow society and the forms found here are pretty well distributed over the valley generally. The following orthoptera are however characteristic.

Camnula pellucida One was collected from high up on Old Baldy of the Jemez. It is more common along the Jemez River than at any other place in our region, from whence it descends the Rio Grande Valley to Albuquerque. It was not collected at all from either the mesa or the Sandia Mts. although it would seem that the grassy banks about Whitcomb Springs, and the stream in Hell Canon would be entirely suited to them. Adams in the Isle Royale report states that there it occurs "On dry upland soil" This illustrates again the same principle mentioned under *Dissosteria caroliniana*.

Melanoplus atlantis. The Lesser Migratory Locust occurs occasionally in the more moist situations on the mesa and

mountains. It is one of the most common valley forms and does more damage in alfalfa than any other.

M. femur-rubrum. Also common here and occasional in the Mts. It has not been collected from the mesa. It would seem to be a little more mesophytic in its requirements than the last species.

Orphulella pelidua, *Burn.*

Mermiria bivetattus. Occurs on *Aster spinosus* which covers low sand dunes in the valley. It is extremely long and narrow, which in connection with its color renders it as inconspicuous on its leafless foodplant as the walking-stick (to which it has a general resemblance) on *Dalea*.

Helochara communis, *Fab* Common here and occurs up into the piñon and Yellow Pine Assns. On *Chrysothamnus pucherrimus* in the Sandia Mts. at Santa Fe and Taos and on *Rudbeckia* and *Solidago* in Jemez Mts.

Culex pipiens. Mosquitoes breed in countless millions in the ponds that form in the valley whenever the Rio Grande is high. This usually occurs in May and June and some when the snows are melting in the Colorado mountains and sometimes in late summer at the close of the rainy season.

There has been a good deal of discussion over the very practical question as to how far mosquitoes will fly. This is a very favorable place in which to study this problem as there are no places away from the Valley where mosquitoes can possibly breed. There is absolutely no possibility of their breeding on the mesa. There are almost no inhabitants there and no cisterns at all. There is no chance of their breeding in tin cans. Although the mesa is the common dumping-ground of the latter, in this dry atmosphere a can even if it were full would lose all of its water through evaporation long before a week was up. So we are perfectly safe in saying that all mosquitoes seen on the Mesa have come from the valley. In our worst places the writer has found them quite numerous about half of the distance across the mesa, five miles from any possible breeding place. An acre of ground here would perhaps shelter about one percent of the number that an acre next to the river would. Beyond this there were a few only. As to the wind as a factor; this was carefully noted during one of our worst plagues. There is

nearly always considerable of a breeze on this mesa, but during this time (late Aug. and Sept.) there had been no violent winds. Indeed a violent wind does not seem to spread them as far as a gentle breeze, as in the former case they seek shelter low down among the herbage and do not venture forth at all. With a gentle brisk wind blowing one can walk at such times in comparative peace across the mesa, while on a more quiet day each step disturbs from a score to fifty or more pests.

The city of Albuquerque should by all means take the trouble to treat their breeding places with oil. The present neglect is a sad reproach to this hustling and otherwise up-to-date city.

Sarcophaga and *Calliphora*, the blue-bottle or flesh-fly and the blow-fly are also too abundant here. This arises from the habit universal in the Southwest of dumping dead animals out on the mesa instead of burying them, a practice that should be stopped.

SPECIES OF VERY WIDE DISTRIBUTION AND NOT CHARACTERISTIC OF ANY PARTICULAR FORMATION

* *Chrysochus auratus*, *Fab.* Collected from North Sandia Mt. at an altitude between ten and eleven thousand feet and also at Belen at an altitude of less than five thousand feet. On *Apocynnm* at the latter place.

Euphoria inda, *L.* From the valley at Albuquerque to the Yellow Pine Assn., and doubtless higher. The adults are particularly fond of the blossoms of the thistle.

Hippodamia convergens, *Guer.* Abundant everywhere from the top of the highest mountains to the lowest parts of the Territory. In the vicinity of Albuquerque it is the only common lady-beetle, there being at least one hundred of these to one of all other species combined and the proportion is scarcely less in the mountains. The markings and size of this beetle are extremely variable but the writer was able to detect no correlation between the different degrees of development of the markings and the habitat.

Monoxia consputa *Lec.* From the top of the Sandia Mts. from beside a snowbank on Oct 30 to the lowest parts of the

valley on a July day. Abundant everywhere, and on a great variety of plants.

§ *Mordella scutellaris*, *Fabr.*

HYMENOPTERA

Apostemon splendens. From the "Hudsonian Zone" of North Sandia Mt. where it was found nesting, to the valley of the Rio Grande. Taken at *Phacelia corruga*, *Biscutella wislizeni*, *Fallugia*, *Malvastricum*, *Philadelphicus*, *Opuntia arborescens* at Wagon Mound and Silver City. From April 19 to Sep. 9.

Polistes variatus, *Cress.* From Elis' Ranch in Spruce forest at 8,000 ft. on North Sandia Mt. to Valley of Rio Grande. Nesting in all situations between.

Tremex columbia. Equally abundant in the Cottonwoods of the valley and the Douglas Spruce of the Mts.

HEMIPTERA

Adelphocosis superbus. From the Yellow Pine Assn. to the valley, Silver City, Taos, Jemez Mts. On *Rudbeckia*, *Cleome*, *Croton*, Rayless Goldenrod, *Chrsothamnus*, *Fallugia*, alfalfa.

Agalia gilletei, *Osborne & Ball.* Mesa and Mts. to Spruce Assn. Abundant under *Yucca* rosettes in winter. (*A. sannuileta*, *Prov.* We collected from the Estancia Valley.)

Euchistus impictiventris. Yellow Pine Assn. to valley.

Gerris remiges, *Say.* On all suitable ponds and streams in both valley and mountains.

Harmostes reflexulus var. *virescens*, *Dall.* From the oak chaparral to the mesa. All in Sept.

Largus succinctus.

Lygus pratensis, *L.* Abundant everywhere and especially so in the Valley, where in summer one can scarcely find a plant without it.

Nysius ericae (*Schill*) *Horv.* Nearly as common as the last species.

LEPIDOPTERA

Basilarchia.

Colias eurytheme, *Boisduval.* Common in the mountains and in the valley wherever there is damp soil, but entirely absent from the mesa. Not as abundant anywhere as in the eastern states.

Nathalis iole. The Dwarf Yellow extends from 9,000 ft. in the Sandia Mts. to the valley at less than 5,000.

Pieris protodice. From the valley to the Spruce Ass'n.

P. napi is less common but has about the same distribution.

Pyrameis cardui. See remarks under Hudsonian Zone.

TERMITES

Termes sp. Are quite common throughout the Sonoran.

Chrysophus sp. The "Golden-eyed Lace-wings" are common over the entire region. They have been found hibernating under the bark of a dead piñon.

SUMMARY AND CONCLUSIONS.

The plant associations are here well defined and they form the best basis for a nomenclature of the animal habitats because they are the result of definite complexes of physiographic and climatic factors and are readily and quickly recognizable.

The distribution of animal associations corresponds with that of the plant associations and is just as sharp and definite, but requires much closer study, owing to the migratory habits and small size of many, particularly at certain seasons. The distribution between mountains, steppe, and valleys is particularly sharp.

Nearly all of the plants and animals of the mountains are identical with, or are closely related, to those of the more eastern and northern states. Because of this we would expect cultivated crops which are a success there to thrive also in our mountains.

The relationships of the steppe species, on the contrary, are distinctly with the arid southwest.

The valley forms are a mixture of the two faunas. Among both plants and animals many species or closely related species are common to both mountains and valleys while absent from the steppe or mesa. This and other facts point to moisture as being the most important single factor in determining local distribution. Practically, this means that many if not most northern crops should be successfully grown in the valley and even on the mesa if moisture can be supplied as by irrigation.

The insects particularly of the Sandias are as a whole distinctly those of the more humid east and north in families as well as species. Crickets abound, of beetles the families

Carabidae, Lucanidae, and Cerambycidae are well represented. Lepidoptera of eastern genera and often species are abundant. Among Diptera, Tabanidae, Tipulidae (Crane-Flies), Simuliidae, the largest Bombyliidae, and Syrphidae are conspicuous. The birds are mostly eastern but the lizards are characteristic. Among Arachnida are Pseudoscorpions, Phalangidae or Daddy Long Legs.

The steppe or mesa is rich in Orthoptera of the subfamily Oedipodinae; crickets are absent. Among beetles the family Tenebrionidae are predominant with Meloidae well represented. Lucanidae, Cerambycidae and Carabidae are almost entirely absent. (One lone specimen only of Lucanidae did I ever find on the mesa). Larger Lepidoptera are scarce. Geomtridae and Tinedae are more common. Among Diptera Asilidae are abundant as are Mutilidae among Hymenoptera. The Arachnida are represented by digging types, Solpugida, Thelyphonidae, (more common further south in the territory), Lycosa, and Scorpionida. Harvest-men are entirely absent.

In the Valleys Carabidae and crickets again appear and a few Tabanidea but no Simulionidae.

THE FAUNA OF THE ISOLATED MOUNTAIN RANGES.

The study of the fauna of the Sandias brings out some interesting things. These with the Manzanos and Ortiz ranges from an isolated mountain group surrounded on all sides by the steppe association except that they are poorly united on the north-east by a band of poorly developed and impoverished Cedar Association with the Santa Fes. The Jemez Range on the contrary is connected with the Colorado Mountains by high plateaux and ranges and the same is true of the Santa Fes. We would hope then to find many species represented in the latter which are absent from the Sandias, and the preceding pages show many of which the following may be cited:

Among plants are alders, Rudbeckias, common dock, Hierachium, tall Malvas, and sedges, timothy (*Phleum alpinum*) a clover, Red-top grass, *Prunella* and *Hypericum*.

INSECTS.

Pachycerina dolorosa.

Stenopa vulnerata. Exceedingly abundant.



"Biotic Succession on Mt. Taylor." The dead trees in the middle are Alligator Juniper. They were pioneers on this Mt. side but the Yellow Pine grew up around them, shaded and killed them. The plant in the foreground to the right is the Yucca Glauca.

Tentanocera plumosa.

Pentaria fuscula.

Psammoshares atrox

Clasteppera obtusa.

Cytolobus vau.

Iphthimus serratus.

Trirhabda 2 sp.

Bombus hunterii.

Carpotrichia culta.

Odontomyia nigrostris.

Doubtless some of the above forms may yet be found to be present in the Sandias, yet the Yellow Pine Assn. from which the above came has been pretty carefully studied in the Sandias..

On the other hand we would expect the Sandias to exhibit some peculiar types and two varieties are here listed. *Cincindela longilabris* var.

Melisodes atrifera sandiarum, *Ckl.* There are several others in my collection that may also prove to be distinct varieties.

The Sandias are connected with the Manzanos by the Manzanetto or Coyote Hills on which occur the Cedar, Piñon and Yellow Pine Assns. However Tijeras Canon interrupts all of these except the Cedar Assn. We might expect then to find a few on the one range absent from the other. The alligator juniper is a striking fulfillment of our expectations. It is common in the Manzanos but seems to be entirely absent from the Sandia.

The following we have collected from the Manzanos but not from the Sandia:

Anelastes drurii.

Collops hirtellus.

Pseudallonyx sp.

Salinis omogera.

Silvanus planatus.

Anthocomus ventralis.

There are probably species present on the Sandias that are absent from the Manzanos but the writer has done too little collecting on the latter to be able to say with any degree of certainty that any species is absent therefrom. Here is

an open field for some biologist of the university, for, as far as I know, the Manzanos have not been visited by any entomologist.

SAN MATEO RANGE

This range of which Mt. Taylor is the culmination is also isolated but connected apparently with the Jemez (Nacimientos) by the Pinon Assn. via. Cabezon and with more southern ranges by means of the Cedar Assn.

Here occur a few species present in the Jemez but absent from the Sandias. Salpa, the alder, and Rudbeckia are examples.

The presence here again of the Alligator Juniper, on a Range directly west of the Sandias is interesting in connection with the more southern ranges.

Around the base of this mountain are two species of Meloe which do not occur in similar associations about Albuquerque. One is apparently the same species figured in Kellog's "American Insects" Plate II. One or two beetles also suggest that some insects of California and Arizona relationships reach their most eastern points here.

A few species creep down the Rio Grande Valley from the north that are absent from the Sandia Mts., although present at Albuquerque. We note:

Ceresa albidosparsa.

Gelastocoris oculata.

Camula pellucida?

Diplotaxis punctata.

Megilla vittigera.

Contrasting markedly with these cases of isolated habitats from which apparently suitable animals are absent, presumably have not been able to get there; is the distribution of the Lubberly Locust, *Brachystola magna*, which invariably occupies all of those shallow basin-like depressions in the mesa where alone it is found, although they are in some cases tens of miles apart. This is the more remarkable in that this locust is entirely incapable of flight.

Another interesting case is that of the Wild Poppy. It is common in the Cedar Ass'n., about Silver City and again at Taos and Wagon Mound but it is absent from the same association in the Sandias and about Mt. Taylor. The peculiar

distribution of this plant would suggest that in these northern situations at least it might be an introduced species.

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"Wooded Slopes on Mt. Taylor."

A GEOLOGICAL RECONNAISSANCE OF BERNALILLO, VALENCIA AND MCKINLEY COUNTIES
DIVISION OF GEOLOGY, J. A. PYNCH, CHIEF

INTRODUCTORY

New Mexico is not built after the plan of the states of the Mississippi valley, for nature has used here a unique type of architecture. The straight skylines and the acute angles of every back-ground are architectural effects common and peculiarly New Mexican.

In the Geological ages of the past there was one Era during which this part of our continent saw its greatest growth. It is known as the Mesozoic Era. Following this came the Cenozoic, in which nature, with broad swoops and splashes, put the finishing touches, on a broad scale, to the present landscape. The first part of this latter era is known as the Tertiary period. During this time Mt. Taylor, the Colorado Canyons, the vast lava flows, the enumerable slips and faults had their day, and so grand was their effect upon the surface features of this locality that the landscape is still predominated by volcanic cones, lava flows, and fault scarps.

New Mexico is a part of a great uplifted earth block. As the Grand Canyon of the Colorado is due to this uplift by the subsequent incisement of the Colorado River, so are the lesser canyons and the many valleys which flute the length of the state due likewise to the upward movement which preceded, accompanied, and also succeeded the volcanic activity, which, as Geologically reckoned, has so recently ended here.

It has been stated that the major valleys run lengthwise of the state, governed probably by two main causes—in one case by a roughly parallel, north and south system of faulting, and, in the other case by a natural slope southward—due to the fact that the highest part of the uplift occurred in the northern part and diminished toward the south. The Rio Grande holds the title, Rio Grande del Norte (Great River of the North) thus conveying by its name not only the idea of

width but also of length however its channel winds to the southward under an ever increasing heat much of its way through a valley cut in loose sands, and through flood plains, at times a half score miles in width where numerous "acequias" rob the river of its water for the plotted ranches which border its banks on either side. The loose character of the materials over which it flows, evaporation, and irrigation are causes which naturally combine at the critical season of the year, when rainfall is scant to cause the river to diminish greatly in volume or to cease flowing entirely. At other times when such as the Galisteo, Puerco and other important tributaries function as great eave-troughs to the roof-like drainage of the mountains, deluged by cloud-bursts, the containing dykes breaks, the big acequias are gorged and overflow and havoc is rampant among the small fruit farms along the flood plains

THE RIO GRANDE VALLEY

The Rio Grande Valley is the central feature of this part of the center of the state. The most densely populated **** locality is along the flood-plains of the Rio Grande, and about one half of the way down its course is situated the metropolis of the state—Albuquerque. On either side the River is flanked by broad, gently sloping clinopains, a term coined by Herrick for the incorrectly called "Mesas." These plains are of considerable importance for grazing but on account of their general inaccessibility for irrigation, and the loose incoherent character of their soils, they are destined * * * * ever to be of very little importance agriculturally. Little use is made of these mesas or clinopains at present, as has been stated, except for local pasturage by ranchers, in which fenced pastures are often resorted to. Occasionally large herds of sheep in their characteristic "take a bite and run" style, pass across them leaving nothing in their wake but the prickly pear, * * * * * pin-cushion cactus and the bedraggled gutierrezia. The surface of these plains is even as far as the eye can see, rising to elevations of one thousand feet or more above the river only, at their greatest distance on either side, broken only now and then by deeply washed arroyos whose incisement in these plains is not a marked feature topographically.

THE PUERCO VALLEY.

To the west, separated from the Río Grande by a low divide not more than twenty five miles wide, is the Puerco River Valley, a broad, open, gently sloping stretch of country a score and a half miles in width. This valley is now occupied by a diminutive stream, shrunk from a once much larger size, by tiltings and warpings of the earth's crust which involved the slopes of its head drainage and diverted it westward. Numerous water gaps and remnants of former valleys, to the west of the present Puerco Valley, outline in part the work of the Puerco and some of its tributaries before fortune worked adversely to the river. There are many strong evidences that the Puerco may have been crowded eastward by the stupendous out-pouring of lava from Mt. Taylor toward the north and east. However, running water, and plenty of it, must be accountable for the broad Puerco valley of today. Between the river and the divide to the east, much and intense block faulting has occurred. Many of the blocks are inclined at angles of 45 degrees or more and are conspicuous features in this locality. On the west side of the river there is comparatively little faulting, but erosion, caused by the run-off of the higher plains to the west, has made the country considerably rougher. Still further west erosion has cut the, now high plateau, into numerous Mesas and denuded many volcanic necks, which characterize this section of the country. Along the upper portion of the Puerco, the valley widens considerably as the river bends westward to skirt the Nacimiento Mountains which limit the western extension of the Jemez Plateau, but continues northward again until it finds its source in the southern portion of Rio Arriba County.

THE ESTANCIA VALLEY

Beyond the clinoplains which, as has been stated, lie east of the Río Grande River, the Sandias and Manzanos—true granite cored, Rocky Mountain types of mountains—rise six thousand feet or more above the river, capped with Carboniferous limestone, which dips at comparatively low angles to the east beneath Estancia Valley; but, from the west, due to a huge fault scarp these mountains present an almost per-



"Along the western side of the Puerto Valley, showing a Volcanic Plug in the distance."

pendicular front though ribbed by cañons of steep gradient.

The Estancia valley, a structural valley at first, now well filled with alluvial wash from all sides, offers exceptionally well fitted land for agricultural purposes, if the underground water supply is sufficiently near the surface and of such quantity as to warrant the sinking of wells for irrigation purposes. The area which drains into this valley is extensive and the structure of the valley is such as has been stated to make it a promising underground reservoir. The question of pumping the water from an economic and practical standpoint, is one, which as yet, has not been satisfactorily answered. The alternative of "dry farming" has been tried but with varying degrees of success.



"Cabezon" A volcanic plug of the Puerco Valley."

In the Geological ages of the past the Estancia Valley figured conspicuously as a lake area, its salt lakes of today being remnants of a once much larger one. Old shore lines still exist which mark the different levels at which the waters once stood, concentric series of beaches outline the extent of these lakes at various intervals. The largest one covered the greater part of the valley and was several hundreds feet deep at the time of its maximum extent: Its old cliffs near Chililli are more than one hundred feet in height. So well preserved are its shore features that one can imagine the

roar of the storm waves as they rolled and beat against the cliffs which contained this inland sea of the past.

To the east and south of the Estancia lies the Pecos valley, similar in some ways to the Estancia but the most developed of any valley area of the state. It is the greatest fruit section of New Mexico and its possibilities have in no way been exhausted. A very elaborate irrigation system has been worked out and applied in this valley and the development of this section of the state has been most phenomenal. The place the Pecos Valley now holds in New Mexico's fruit producing areas is one which may be duplicated many times when other similar valley areas of the southern part of the state experience like development. It is proper to consider these parts of the state as the coming fruit country of the southwest.



"The Backbone of North America."

THE CONTINENTAL DIVIDE

If we recross in part the area just sketched to the fault scarp of the Sandia and Manzano Mountains, we must then begin the long climb of about one hundred and forty miles to the crest of the Continental Divide.

This upwarp of the earth's crust is two hundred miles or more broad at its base and measures from base to crest

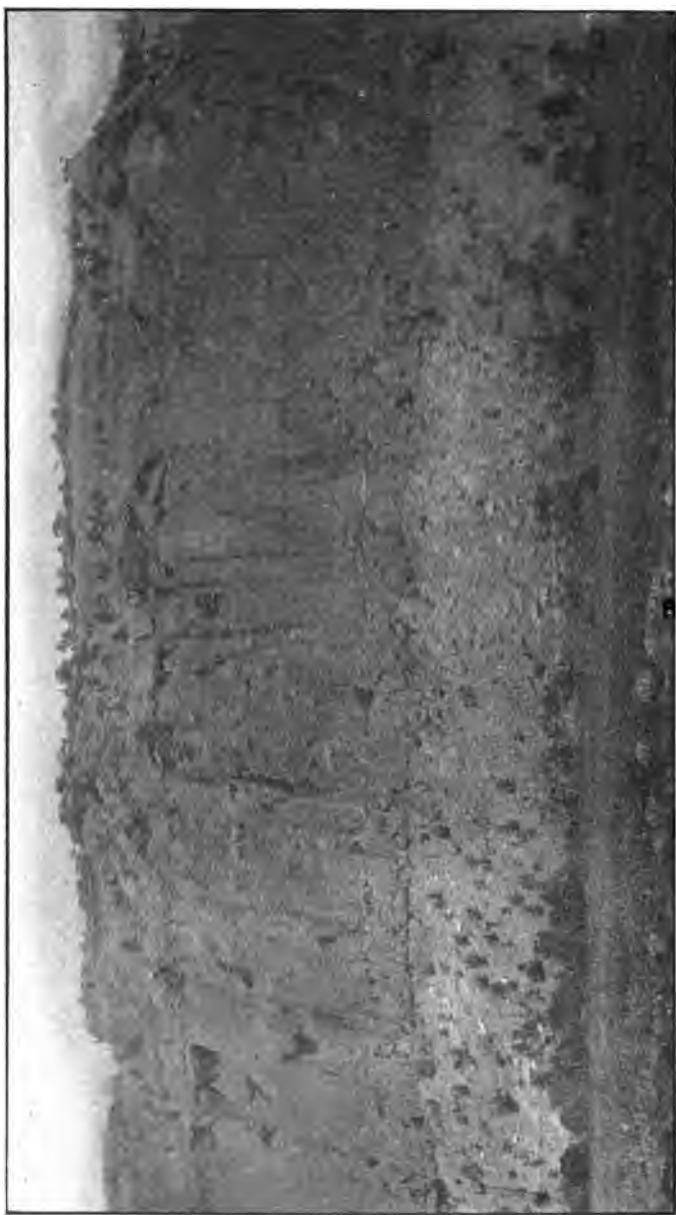
about two thousand feet higher than the surrounding country. The Divide is not one long symmetrical roll but is serpentine in outline and domed near its central part, the dome roughly marked by the Zuni Plateau. To the north the folded strata which make up the Divide gradually become less and less inclined until the crest loses its characteristics of a fold in the plateau-like portion of the northern part of the state.

The Divide is composed entirely of sedimentary rock except where lava outflows have spread over its eastern flanks. Jura-Trias sandstone is the lowest exposed rock along the northern side of the San Jose Valley from Bluewater Station westward over the Divide. The Cretaceous strata above are of wide spread exposure, the Laramie coal measures outcropping in Satan and San Anton Passes and at numerous other places, especially, throughout the first score of miles along the western side.



"A high point on the Continental Divide."

An easy pass over the Divide is afforded by the San Jose River whose valley heads up into the Divide from the east, west of Mt. Taylor. The San Jose valley, as has been noted above, opens up a large valley in Jurassic and Cretaceous strata, to the north of the Zuni Plateau. The Jurassic strata disappears beneath the Cretaceous some twenty-five miles



"Jura-Trlos Sandstone, Continental Divide."

or more east of the divide, since the San Jose River flows with the dip. But at about the point of the disappearance of the Jurassic, the volcanoes and their accompanying lava flows spread over and fill in part the valley, the earlier flows from Mt. Taylor reaching some distance east of Laguna. A short



"An earthquake crack, Bluewater Valley."



"A recent lava flow in the San Jose Valley."

distance west of Bluewater Station partially filled earthquake cracks are common and some very well preserved volcanic cones are situated along the northern side of the valley.

Between McCarty's and Grant's Stations, there is a very recent lava flow which apparently came from the high Mesa country to the southwest. So recent is this flow that there is scarcely any evidence of weathering whatever over its wrinkled, twisted and frothy surface.

The San Jose occupies a valley far out of proportion to the size of the river, which, coupled with the fact that the pass on the Divide is a very low, wide saddle, about the same width as the valley far to the eastward, seems to substantiate the theory that the San Jose once had a much larger drainage area along its headwaters, which, have been diverted westward as, in the case of the Puerco, by the subsequent uplift of the Divide, and the present pass is nothing less than an old water-gap, now a wind gap, due to the inability of the San Jose to keep downward erosion equal to the upwarp. The largest tributary of the San Jose is Bluewater Creek, a



"Mouth of Bluewater Cañon."

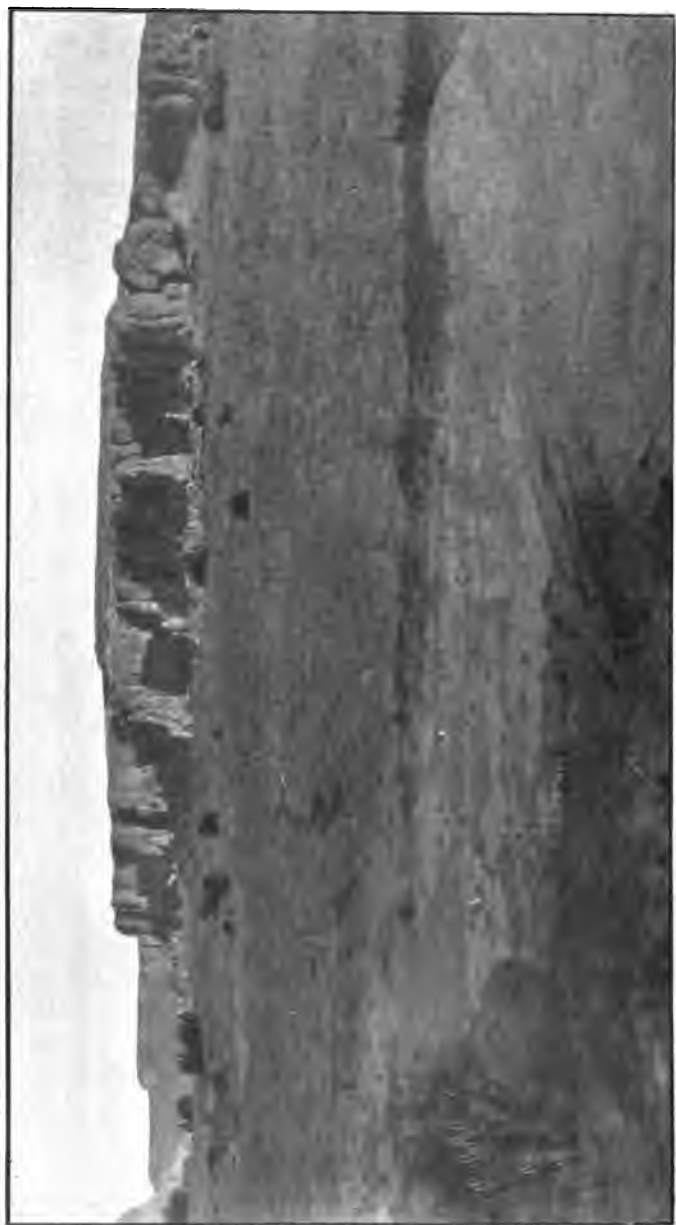
small mountain stream which drains a large portion of the Divide south of the headwaters of the San Jose. This creek at times becomes a raging river of no mean dimensions or importance when heavy rainfall occurs along the roof-like eastern slopes of the Divide. Bluewater Creek flows through a box canyon before it reaches the lower valley. For a dozen miles or more this canyon arises in perpendicular walls, at

times fifteen hundred feet above the channel. It is one of the most picturesque places of its kind along the Divide. At the head of this canyon is a natural amphitheatre which offers exceptional opportunities for the construction of a dam and the use of this natural basin as an irrigation reservoir.

Several attempts have been made to construct cheap earth dams at this place which of course are not invincible to the mighty strain placed upon them by the enormous head of water which gathers at times of cloud burts along this part of the Divide. There is no provision made at present for conserving the waters of the creek for the large, fertile, and well deserving Bluewater Valley to the east of the canyon. If this project was properly financed it would supply an abundance of water to the large agricultural tract down the Bluewater, San Mateo, and San Jose Valleys.

THE BLUEWATER VALLEY

The Bluewater Valley, together with the San Mateo valley which joins the San Jose at about the same place, make up about twenty one thousand acres of the richest and most valuable land in west central New Mexico. As both of these valleys are in close proximity to the Mt. Taylor and Zuni Plateau volcanic areas, and since volcanoes of lesser magnitude than either of the above named, are situated west of the town of Bluewater, the Bluewater valley is said to be underlain with eighty feet of lava from the flows of different ages from the above sources. The two latest flows being well shown just west of McCartys. This lava outcrops in places all along the valley but the outcrops are small in area. There are about seventy-five families at present in this locality trying hard to develop the the section into an agricultural community but they are hampered greatly by lack of water. The writer visited the ranch of Mr. C. E. Kyle near Grants. This gentleman has some water for irrigation purposes, and the healthy and vigorous growth of beans, potatoes, alfalfa, turnips, corn, and wheat with insufficient water well attested to the possibilities of the soil in this valley if conditions were such as to give growing crops a normal supply of water. A head of wheat gathered at hapzard contained kernels as plump as some of the plumpest kernels ever seen in any of the wheat-growing states. Chemical analyses show



"Acoma Indian Pueblo" on top of the mesa.

this soil to equal in fertility like residual soil of any locality the world over. Valley lands like those of the Bluewater, San Mateo, and San Jose Valleys, are under present conditions, much more to be desired than Mesa lands near the same locality or under similar situations, but let the water which now courses down these valleys be conserved by suitable dams and be distributed by irrigation ditches at opportune seasons and small fruit farms, garden truck, orchards, or ranches will furnish occupations *for thousands* of people and feed a very dense population. Practically all that is necessary to bring about these ends in these localities and many more similar places of New Mexico is conserved water, a plow, and a determined settler.

THE ENCHANTED MESA.

About twenty-five miles south of Mt Taylor is the Acoma country and its enchanted mesa. In the first text books of Physical Geography that were written, the enchanted mesa was on of the interesting pictures of an interesting phenomena—the erosive work of water. Once its top afforded protection to a harassed people, today its top with its scrub cedars and pinons, affords a refuge for scores of eagles and others of the bird family. The Enchanted Mesa stands alone, clear and free from all other erosion remnants which are scattered about over the valley and which once helped to make up the whole of the massive sandstone formation of which each is now a part. The Mesa is braced by banks of talus on all sides, above which sheer walls rise scores of feet to the flat pan-cake like top. The enchanted mesa seems to have made a determined stand against the invading processes of weathering. This mesa was chosen for text books, not alone for its perfect illustration of this type of topographic phenomena but because it is a classic example of a process that will occur under any similar conditions of uplifted land surfaces to a plateau elevation and the subsequent removal of the parts most easily eroded. Composed entirely of a fairly hard, compact, gray and buff sandstone of several acres in extent this interesting topographic feature is doomed very soon, geologically, to the erosive and valley making processes now so dominant over this locality.

Acoma, the Indian Pueblo, which is situated on a mesa

similar to the Enchanted mesa in formation, now supports the primitive town which has superseded the ancient Pueblo that once had its site on top of the Enchanted mesa. Convenient sand dunes furnish in part, a heavy, sandy approach to the summit of the mesa, and a rocky quarried passage way, completes the bridge to the top.

MT. TAYLOR

Lying about half way up the eastern limb of the huge anticline which forms the Continental Divide in this section of New Mexico, is the magnificent, yet badly eroded volcanic cone-Mt. Taylor. This cone is the most imposing of the two hundred plugs and cones which are scattered along the western side of the Puerco Valley. The crater rim, of this volcano which measures approximately six miles in diameter is dissected by numerous canyons which rib the sides of the cone. Down these canyons, in nearly all cases, trickle brooks



"A Thunderstorm over Mt. Taylor."

fed from springs far up the mountain side. This water is pure and wholesome, but at the southeastern side of Mt. Taylor near El Rito is a well made useless from the amount of sulphur and hydrogen sulphide which impregnates its waters.

If the block faulting which characterizes this region is Post-Cretaceous and Mt. Taylor is late Oligocene or early

Miocene as the case seems to be, there are some grounds for believing that the extrusions of lava by the many volcanoes of the western side of the Puerco valley, as well as those of the western side of the Rio Grande valley, in roughly continuous lines as they appear today, are due to the weakening of the crust in each case along a major fault line and the extrusions took place in the way, and with the relations, which they sustain to each other and to the volcanic phenomena of this region because of this faulting. In very few places, and then in not any marked degree, is subsequent faulting noticeable. This fact alone proves the faulting to have been practically completed before the volcanoes and lava flows took place.

In several places along the Puerco valley there are good evidences that the Tertiary sedimentaries were deposited after considerable erosion had taken place over the Cretaceous, this erosion period being the equivalent of the Arapahoe and Denver transition period.

There is a question bound to arise in the mind of him who travels across the Chivote Mesa or in other words the immense lava flow which extends northward from Mt. Taylor seventy-five miles or more.

This question suggests the idea that there was a dominating influence in the existing topography of the time which invited the flow of Mt. Taylor lava to the northward, and, since lava, as all other semi-liquids seeks the easiest routes it seems reasonable to suppose that the Chivote Mesa of today occupies an old river valley, probably that of the Puerco, and as has been mentioned before, the crowding of the river from its old pre-Mt. Taylor valley by this lava flow, coupled with the upwarp along its head waters by the movements which made the Continental Divide, are the two responsible factors in bringing the Puerco to its present diminutive size, which is so out of harmony with the size of its valley and with the task of erosion which such a valley the size of that of the Puerco represents.

From a near view Mt. Taylor is quite disappointing. In general outline the angle of the cone is low, but after the base has been reached there still remains many weary miles of hard climbing before the top is scaled.

From the rim the view is down into a large depression, the old crater about six miles across, in whose center arises a subsidiary cone a thousand feet or more in height. Much of the Crater and all of this secondary cone is forest clad, and stately pines grow where hissing blasts of steam and fiery beds of lava once spread their lakes of molten rock far over the crater rim. Today in the openings among the pines the strawberry and violet bloom in August, and tardy spring is followed by a few days of summer which are again superseded by an autumn whose short existence ends with the first southeaster of early November.



"Looking into the Crater of Mt. Taylor."

The lowest notch in the crater rim is on the eastern side through which a stream of ice cold water, partially drainage from the inside of the crater makes its way out of the cool shady glades to the thirsty sun baked mesa below.

THE MT. TAYLOR AND SAN MATEO FOREST RESERVES

Over much of the surface area of the Mt. Taylor lava flows there grows such valuable timber that the Federal Government has seen fit to reserve a large area which includes some of the most valuable sections of the timber land. Under the excellent care of the forest rangers there has sprung up here and there in favorable localities heavy thickets of young pines. In the openings and due to the abundant rainfall of

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"A Pine Park on Mt. Taylor."

these altitudes luxuriant grass grows knee high, untouched by any devouring herbivores. A large tract of nearly equal value east of these reserves has been purchased and fenced in by private parties. Several small lakes of crystal pure water are scattered over this lava plateau. These lakes nestled away in natural sags of the surface among surrounding pines one hundred and fifty feet and more in height afford great



"A Canyon on the Slope of Mt. Taylor."



"The Continental Divide on Skyline. In foreground grass and timber on the Chivote Mesa. A lava flow of Mt. Taylor."

cheer to man and beast who travel the long and rough, yet scenic road across these reserves from San Mateo to Cebolleta.

Many of the Spanish land grants growing valuable timber are apt to be bought up by private parties like the one mentioned above. If this be the case not only will the state or Federal Government be great losers in the future, but they will experience the same difficulty that many other states are, to their sorrow, experiencing, that is, from the fact that often these private lands are contiguous to reserves, the government will have to give private interests fire protection in order to conserve their own. It is a menacing problem, one which should be handled by state and Federal authorities while the remedy is applicable. Once these areas are denuded by fires or injudicious removal of the timber by private parties or corporations then what is now valuable and producing land will, in a few years, become vast stretches of barren rock. When the protecting blanket of stately trees with their mighty roots cementing and holding the loose mantle waste in place, are once removed, and when the protecting covering of grama and nolinia grasses become inoperative, due to the lessened humidity, due in turn to the removal of these forests, the unequal rainfall that will then take place, will remove in a few years the soil that has taken the weathering processes of centuries to form and only hard, black, barren lava will remain to tell the story of man's indiscretion.

ACROSS THE CONTINENTAL DIVIDE

As viewed from the car window at Gonzales the Continental Divide will not awaken any superior interest. A very gentle slope, an increase to some degree in the number of pinions and scrub cedars, the labored puffing of the engine giving way to the greater rumble as increased speed accompanies the descent on the opposite side and the backbone of the continent may seem after all a very insignificant affair. But he who follows the winding wagon road skirting at times perpendicular walled arroyos or creeps along between rock walls on one side and a sheer descent of one thousand feet on the other, he who climbs inclines so steep and long that the fagging team refuses to go farther without frequent breathing spells, or when the crest of the hill is attained finds only



Gonzales on the Continental Divide, from the east."

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a steeper descent awaiting him—and miles, miles, miles of just this sort of thing—then the topographic meaning of the term “Continental Divide” assume its true importance. As has been said before, the crest of the Divide is sinuous, likewise the trail which follows the crest for a score of miles or more before it takes one headlong plunge to the western slope.

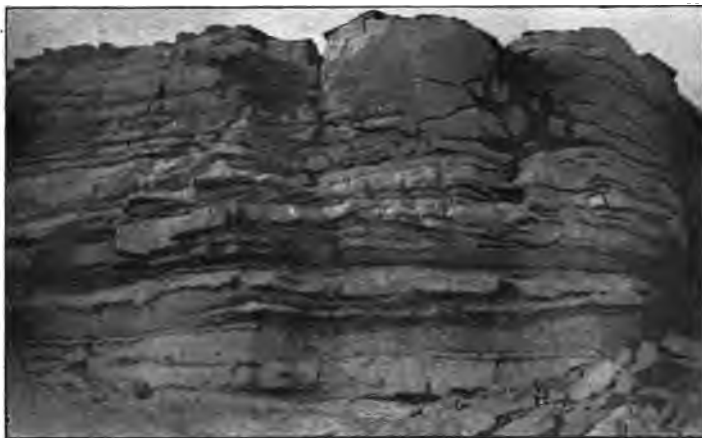


“A sheer rock wall, along the Continental Divide.”

Weathering has opened up a broad area long the axis of the divide through which the road climbs to the top. After once entering this trough-like depression it is only at intervals that a glimpse of the slopes without on either side is obtained and so constant is the rise there is not the least hint of a change until by a sudden turn and within the space of a few rods, the rim of a long fault scarp comes into view down whose tortuous descent the road winds to the western slope of the Divide.

ON THE WESTERN SLOPE

As far as the eye can see only low erosion remnants are visible. A gentle dip northwestward and monoclinal shifting down along the softer strata, so dominates the topography, that, unless one observes closely, the shifting might be mistaken for distributive faulting from which this part of the Divide is exceptionally free.



"Carbonaceous Shale, Seven Lakes Oil Region."

Aside from these low, mound-like hills this region is barren of any vegetation except a scattering prairie grass, whose scantiness leaves the unprotected soil open to the attacks of the wind which strip it from every available surface and heap it about the giant *Gutierrezia* bushes making the surface of these plains in some places very rough and hummocky.

As the descent is made from the crest of the Divide west-



"Aridity and Erosion Continental Divide."

ward Carbonaceous shales outcrop., interstratified with other Sedimentaries and grade into fairly good coal seams. These shales and coal seams are quite constant phenomena along the western slope. They are in about the same latitude as the Cerrillos fields northeast of Albuquerque and have a genetic relation to them which will be spoken of later. The fact that there is a lack of any noticeable amount of faulting on the western side as compared with the frequency of faulting on the eastern slope should be noted here, as it has a very important bearing upon the resources of the two regions.

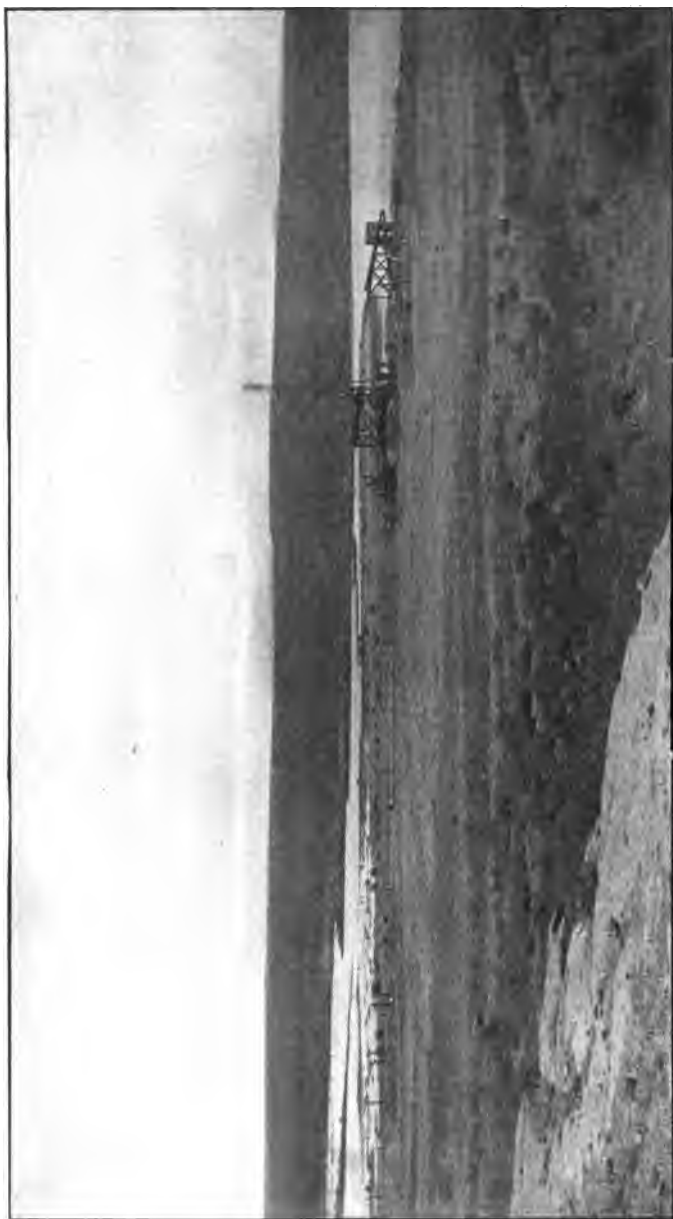


"An Erosion Remont on a windwest portion of the Continental Divide."

That there is a probable connection between Carbonaceous deposits such as coal beds and oil fields is a generally accepted fact among Geologists. Just what the chemistry is of the formation of crude oils, and just how they are formed it as yet not fully understood. It is enough however to state that oils are derived from some organic origin either plant or animal, as for instance, fossils occurring with coal deposits function as explanation enough for the present.

SEVEN LAKES OIL REGION

This region is thirty three miles northeast of Chaves and about twenty west of the Continental Divide. The area about Seven Lakes is one of low relief in Cretaceous strata. Low broad folds characterize the region and are a noticeable fea-



"Seven Lakes Oil District."

ture in the long fault scrap just east of Chaco Canyon. They are in evidence, but not so clearly defined, elsewhere over the region. Out crops of coal and Carbonaceous shale are common in this locality but owing to the fact that there is very little fracturing or faulting in this section, oil seepages are practically unknown.

The well which first brought Seven Lakes into prominence as a possible oil district, is situated on the southeast quarter of section 18, town 18 north, range 10 west. Oil and gas were struck here in the latter part of June, 1911, by the Brock Bros, while drilling for water. The well is 360 feet deep, size of casing 6 inches. Water was struck at a depth of 58 feet and rises within 27 feet of the surface. Through the kindness of Mr. Brock a log of the first well is given below.

Soft yellow material	22 feet	
Soft gray sandstone	38 feet	
Tough blue clay shale	40 feet	
Hard blue shale.....	20 feet	
Soft, sticky, blue, clay-shale..	40 feet	
Gray soft sandstone	20 feet	
Blue sticky shale fire clay....	60 feet	
Soft coal	6 feet	
Blue medium shale	34 feet	
White soft sand and shale....	8 feet.	Contains gas and oil.
Blue gray medium shale	17 feet	
Brown hard sandstone.....	15 feet	
White soft shale and sand....	20 feet.	Contains gas and oil.
Hard blue shale	20 feet	

The conditions here are not different from those of most other oil regions. The oil sands of Pennsylvania run as low as five feet in thickness while some of those of California run as high as a hundred feet. ¹In oil sands of different oil regions the average is nearer that of the Seven Lakes region. Some experts of the east regard 5 ft. of oil sands as paying territory when other conditions are normal. It has been estimated that in average conditions there may be from six to twelve pints of oil in a cubic foot of sand but only three-fourths of this is generally obtainable. While other estimates place the average of 10 per cent porosity of the sands

(1) Ries "Economic Geology."

which will yield one gallon per cubic foot or five thousand barrels per acre in five foot sands. The average under such conditions may not be over 800 barrels per acre. Excessive use or the drilling of other wells are generally causes for the usual decrease in the flow of wells.

In an analysis of the oil of the first well made by Professor Clark of the University, the data is as follows:

Temperature of distillate.	% of product.	Nature of product.
Below 150 degrees. C	4.5	} Naptha.
From 150-200 " "	5.5	
" 200-250 " "	11.75	} Illuminating oil
" 250-300 " "	14.00	
Above 300 " "	53.00	} Lubricating oil of excellent character
Residuum and coke.	11.25	

Professor Clark further states that the sample furnished by Mr. Edmund Ross, from which this analysis was made, upon standing for ten days, divided into three clearly marked portions as follows:

Top layer of crude petroleum .87 Sp. Gr.

Middle layer of crude petroleum and some fine sand and clay .979 Sp. Gr.

Bottom layer water.

A portion of the middle layer was diluted with ether and when whirled in a centrifuge a considerable amount of water and fine clay sediment separated. The top layer of oil was taken for distillation as it is probably typical of the whole sample when freed from sediment. The Professor states that the distillate, in his opinion, will run some higher in the oil at the wells as the samples brought in are not tightly corked.

Another sample than that analysed, but from the lower region was used in the determination of its specific gravity by the mineralogy students who found it to be .993, or by the Baume scale, 26.770. ² The sp. gr. of other fields in this country range from the heavy oils of West Virginia at .873 sp. gr. to the Beaumont, Texas oils of .920 sp. gr. Several authorities on oil besides several geologists have visited the fields and all seem to agree that the deep wells will test the

(2) Ries "Economic Geology."

value of these fields as it is not probable that in any place over the fields will there be found an abundance of oil in shallow wells, what oil is found in the shallow wells is probably due to accumulations under the low anticlines which are characteristic of the region. If deep wells prove successful it will undoubtedly be due to the fact that there is an accumulation of oil beneath the whole of this part of the Divide, which, in that case might prove to be widespread. This seems however very remote. Since the fields are on the western limb of the Divide it is rather difficult to see just what other explanation might fit the conditions if this hypothesis does not approach the true structure there operating. At present, reports state that use is being made of the oils from the first well to run a simple oil engine in drilling another well near it. Soft coal is abundant and easily obtained in this region and the lakes furnish water for running engines in drilling throughout the fields.

Much interest has been manifested in the locality and all possible territory within a radius of twenty miles has been surveyed and taken up by parties from all over the southwest. Should the field prove a winner the surveyed areas will all be very valuable oil fields.

CENTRAL NEW MEXICO ONCE A COASTAL PLAIN

The coal fields at Gallup, the coal and oil fields at Seven Lakes, the Cerrillos fields, and the intervening areas bearing evidences of relationship to the whole, have a significance which cannot be neglected in trying to unravel some of the history of the geological formations of the state.

Although the area east of the Divide situated in the same latitude as the coal fields mentioned above, is badly faulted, (especially is this true in the valley of the Puerco river about Cabezón.) there still remains here and there in persistence of strata found much further south and west, in occasional Carbonaceous shales and lignite beds as far south as San Francisco and San Ignacio, analogous evidences of a continuation of the same formation as exists on the east side, to those which are found on the west side of the Divide. The probability then, is, that minor faulting and the great fault which gave rise to the displacement along the western face of the Sandia mountains, carried the coal formations far beneath

the surface between the Cerrillos fields and the Divide and so accounts for the abundant evidence of a continuation of the coal fields from Cerrillos to Gallup.

It seems practically certain that the area in question represents in the times of the coal formation an old coastal plain which extended entirely across the state and that this old cretaceous coast line warped enough at times to vary the conditions so as to make it favorable for the rapid and luxuriant growth of vegetation along this belt. As these warpings increased in amplitude and frequency the conditions favorable to coal deposits ceased and Carbonaceous shales, characteristic of marshy conditions became prevalent—these are the formations which now outcrop so plentifully where faulting is not a prominent feature in the geology. These shales are well exposed along the cliff faces of Chaco Cañon twenty miles northwest of Seven Lakes. Since the period of coal formation ceased along this east and west belt, there have been notable changes in the topography. Enormous erosion intervals as well as periods of deposition intervened between the Coastal Plain period and the period of vulcanism which covered not a small portion of the area with a thick and protecting coat of lava. Then in turn came a new order of affairs in which more faulting and erosion brought things to their present state of complexity and apparent incongruity.

CLIMATIC HISTORY.

Ever since the inauguration of dry land in New Mexico the evidences are that semi-arid climate has been the rule. It is true that the writer has found numerous examples of petrification of Cretaceous vegetation but this can all be accounted for without any vast change of climate. Several authorities claim at least a humid Pleistocene climate. They believe conditions which gave opportunity for heavy glaciation to occur in the mountains of Colorado and throughout the northern three fourths of the Cordilleran system, gave an extremely humid climate to New Mexico, which is very probable. It is undoubtedly the fact that glaciation and its accompanying sources of water was responsible for many lakes over the state, as for example, in the Estancia Valley.

Arguing for these facts some may endeavor to bring these

climatic changes nearer to the present and read their reaction on life within the history of man. This seems entirely unwarranted because of the fact that rainfall once and always means erosion, the sacrifice of straight lines and sharp angles, for gradation and curves. A glance only at the present landscape disproves this at once as curves are not characteristic of New Mexican topographic architecture. If abundant rainfall was characteristic of the past such as is claimed by some authorities as necessary to support a much larger population than is found here at present, the indications of such humidity would be evidenced in a corrugated topography, and the intermittent streams of the common arroyos would long ago have turned the average evenness of all topography not mountainous into general roughness and bad-lands. Scattered about over the whole state are ruins of once populous aboriginal towns. These ruins built of stone, cemented together, not with mortar, but with adobe, could not withstand the humidity of a very damp climate. The conclusion which must inevitably be reached by those who travel over wide areas of the state and see it more as a whole than a part, is, that what is now the order of affairs as far as climate is concerned, has, at least in the history of man, always been thus. The most inharmonious characteristics of all the major topographic features of the state, are the broad, well eroded valleys, such as the Puerco, Rio Grande and Pecos, with adjustment and age carried on so far as to partially eliminate all falls or rapids, and the intervening divides scarcely attacked at all by tributaries. Since precipitation makes river systems, or, in other words, develops a well worked out drainage by many tributaries to the main stream, we must necessarily conclude that this has not been the case and that glaciation at the head waters and occasional floods, are, on the whole responsible for the major phenomena occupying the present drainage system.

HUMIDITY AND CLIMATE

New Mexico has a variety of climates. Due to the elevation of the northern part of the state, considerable snow and cold weather are characteristic of the winter season, while moderate temperatures and sufficient rainfall are characteristic of the summer months. Throughout the central part of

the state moderate winters and warmer summer are the rule with occasional rainfall. In the southern one fourth of the state very equable winters and hot summer make possible all kinds of fruit growing and raising of garden products, as for example the peach industry of the Pecos River valley and the cantaloupes of the Mesilla Park district. Here and there over the entire state protected valleys help locally to change the general order of the climate, while elevation controls directly the amount of rainfall, and the topography and character of the soil determine the amount of run-off.

The year of 1911 has been a phenomenally humid one in this territory. The driest and most unproductive areas of the state have this year raised considerable vegetation besides the usual cactus and Russian thistles. The higher land from the Rio Grande, on, to, and over, the Continental Divide has been covered this year with an abundance of grass. Over these mesas there is generally not enough rainfall to cause any appreciable amount of grass to grow. It has been often the case for weeks at a time during the growing season of 1911 that irrigation in the valley has been entirely unnecessary. High plateaus and mountains are generally the recipients of more rainfall than the neighboring low lands, and because of this fact the highest uplands and especially the mountainous tracts, are often heavily forested, and many such areas belong to forest reserves. The Zuni Plateau and the Chivote Mesa are very good illustrations of the first example of the most humid areas of the state, and any of the higher mountain ranges such as the Sandias and the Manzanos are examples of the second. Because of these facts the higher lands which are now forested should early receive all necessary protection not only from fires but also from injudicious cutting of timber, which is sure to take place as the country develops and this class of lands pass from land grants into private hands. If cutting of timber is allowed to go on over these areas and their elevated slopes are allowed to be laid bare to the weather, not only will they be denuded of all remaining ***** vegetation, but irrigation dams and lakes far down the valley which receive their drainage, will be silted up and their purposes defeated. It is an undoubted fact that forests and vegetation effects rainfall, therefore, protected forests

and encouraged immigration, with increased cultivation, will be potent climatic features of the future. As New Mexico lies within the migrating belts of the horse latitudes and trade winds, the climate has a fundamental cause for constant semi-aridity. But protected forests and increased cultivation will serve to increase humidity, and, can be reckoned as influencing factors on the climate as the state develops.

New Mexico is certainly entitled to be called "The Sunshine State." As a natural out-door sanatorium for tubercular affections this state holds its own peculiar asset, sunshine of the most continuous sort, and the pure, wholesome air of an elevation of more than a mile make any part of the state a great boon to all sufferers from pulmonary infections.

THE NEW MEXICO OF TOMORROW.

The frontier of a decade ago is a thing of the past, some of its characteristics still remain but with the next generation they will be gone forever. The southwest has been the last to receive the attention of the world of trade and of the influences of the south and east. The reason for the former may be the scarcity of production, the reason for the latter the small percentage of immigration. Of recent years there has been a wonderful invasion of the eastern part of the territory by settlers from Texas and Oklahoma and from states farther east and south. Already the advance line of this movement has nearly reached the central part of the state, and Estancia Valley is following the rapid development of her neighboring valley to the east, the Pecos. Where now only trading posts and small hamlets or Indian pueblos dot the map of western New Mexico, in a very few years thrifty villages and well ordered ***** ranches will signal to the world and to neighboring states the true value and status of this commonwealth. The natural resources of New Mexico are many and varied. Among the most ***** prominent are agriculture and mining.

AGRICULTURE

This state is not especially an agricultural community in the sense in which the term is used on the plains. However, everything outside of mesas and mountains which is available for irrigation may be counted as an agricultural possibility. Irrigable valleys and plains of the southern one half of the

state are already either growing fruits or are held by their owners at high rates. It seems probable that the ranch of diversified farming will follow the main river valleys northward, leaving the broad, upland, level tracts in the northern part of the state for the larger ranches while mesas fill their role for sheep or cattle pasturage.

MINING AND FORESTRY

Considerable has been said already concerning the valuable forests which blanket every mountain range of average elevation. By the exercise of some discretion in their use, and education in controlling them, these forests may become more and more valuable as time goes on.

There has never yet been any true estimate made of New Mexico's mineral wealth, partly because so little is known of what is here. It is known, however, that there is plenty of coal and probably considerable of the more precious metals. Her true status as a mineral state has not as yet been reached or dreamed of and the future will reveal only by a systematic study of the Geology of the state, what is today Nature's secret. The lithological framework of the state, is, in the fundamentals, similar to the great mineral states of the west and in many ways New Mexico has a larger variety of conditions. These conditions mean much for the role which New Mexico is to play as a mineral state in the future. The eyes of the mining world are upon this mining locality and nearly every day inquiries are made as to natural products which the state affords. It is hoped that in the near future a thorough investigation and reliable statistical report may be made of at least some of the most important ores—their location, nature and mode of occurrence, theory of origin, and desirability of development.

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